YAMAHA

2008

SERVICE MANUAL

XT250X
XT250XC

XT250

LIT-11616-21-52

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EAS20050

XT250X
XT250XC
SERVICE MANUAL

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P/N LIT-11616-21-52

EAS20070

NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

EAS20080

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the vehicle operator, a bystander or a person checking or repairing the vehicle.
CAUTION:	A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

EAS20090

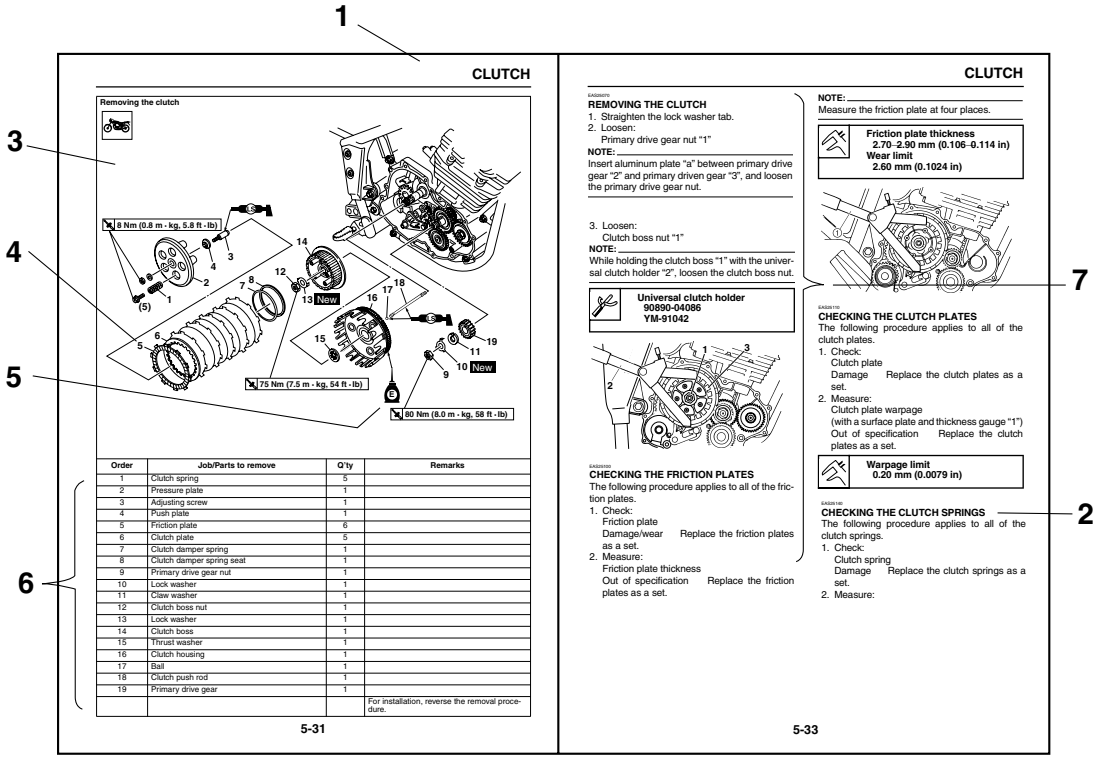
HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

- The manual is divided into chapters and each chapter is divided into sections. The current section title is shown at the top of each page “1”.
- Sub-section titles appear in smaller print than the section title “2”.
- To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section “3”.
- Numbers are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step “4”.
- Symbols indicate parts to be lubricated or replaced “5”.

Refer to “SYMBOLS”.

- A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc “6”.
- Jobs requiring more information (such as special tools and technical data) are described sequentially “7”.



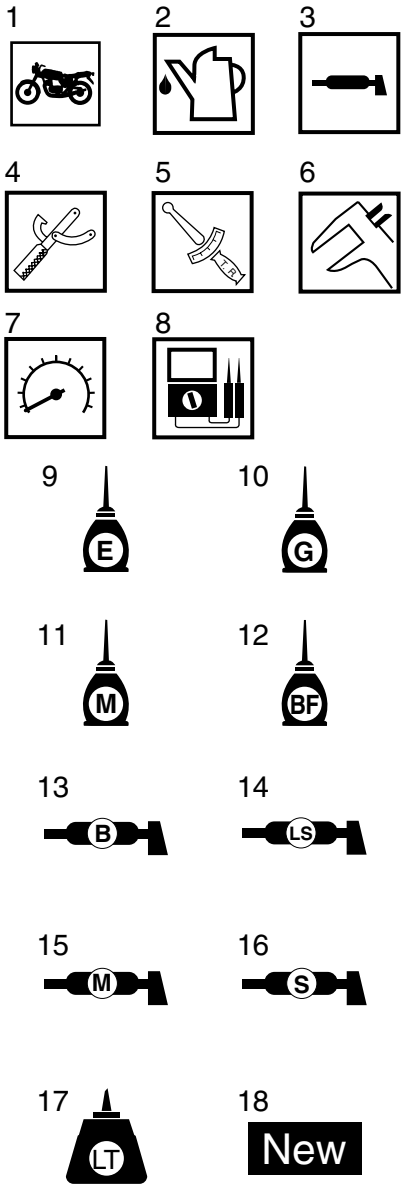
EAS20100

SYMBOLS

The following symbols are used in this manual for easier understanding.

NOTE:

The following symbols are not relevant to every vehicle.



1. Serviceable with engine mounted
2. Filling fluid
3. Lubricant
4. Special tool
5. Tightening torque
6. Wear limit, clearance
7. Engine speed
8. Electrical data
9. Engine oil
10. Gear oil
11. Molybdenum-disulfide oil
12. Brake fluid
13. Wheel-bearing grease
14. Lithium-soap-based grease
15. Molybdenum-disulfide grease
16. Silicone grease
17. Apply locking agent (LOCTITE®)
18. Replace the part

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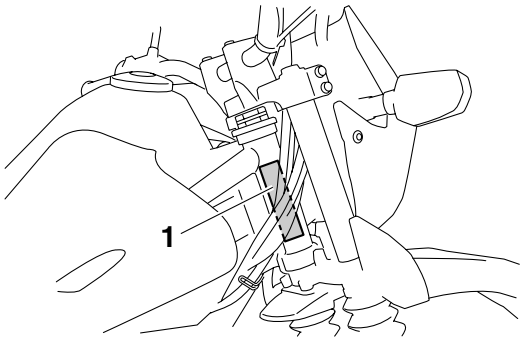
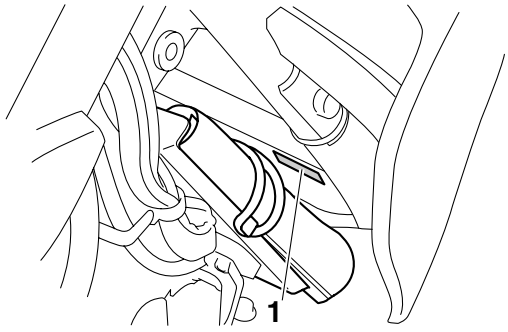
GENERAL INFORMATION

EAS20130
IDENTIFICATION

EAS20140
VEHICLE IDENTIFICATION NUMBER
The vehicle identification number “1” is stamped into the right side of the steering head pipe.

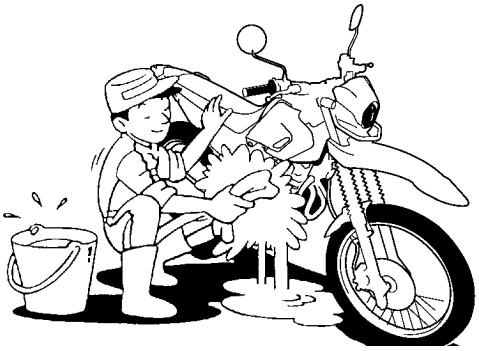


EAS20150
MODEL LABEL
The model label “1” is affixed to the frame. This information will be needed to order spare parts.



EAS20180
IMPORTANT INFORMATION

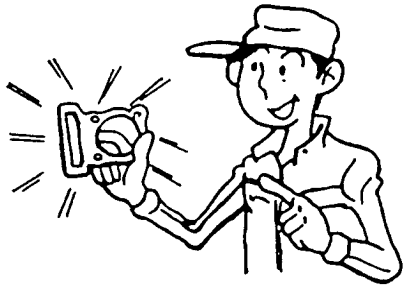
EAS20190
PREPARATION FOR REMOVAL AND DISASSEMBLY
1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



2. Use only the proper tools and cleaning equipment.
   Refer to “SPECIAL TOOLS” on page 1-5.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.

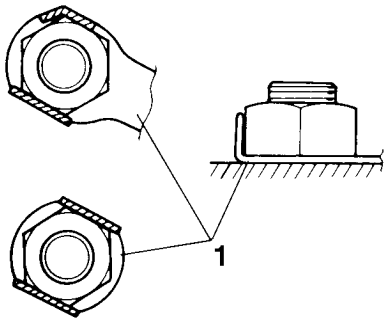
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200
REPLACEMENT PARTS
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

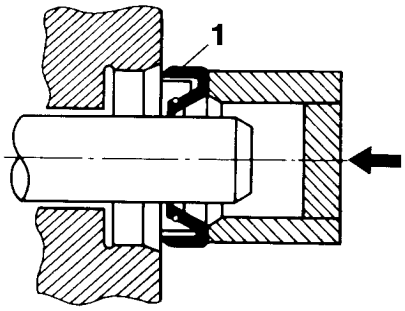


EAS20210
GASKETS, OIL SEALS AND O-RINGS
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.

EAS20220
LOCK WASHERS/PLATES AND COTTER PINS
After removal, replace all lock washers/plates “1” and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



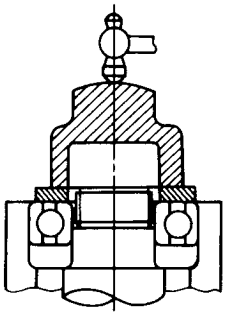
EAS20230
BEARINGS AND OIL SEALS
Install bearings and oil seals so that the manufacturer’s marks or numbers are visible. When installing oil seals “1”, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

CAUTION:

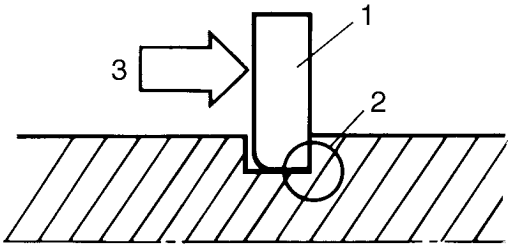
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



EAS20240

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip “1”, make sure the sharp-edged corner “2” is positioned opposite the thrust “3” that the circlip receives.



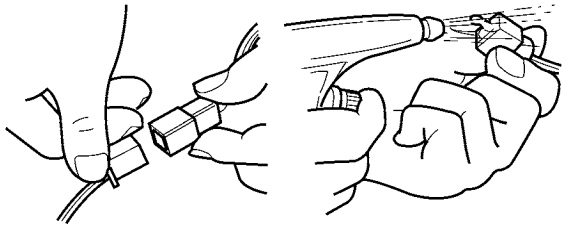
EAS20250

CHECKING THE CONNECTIONS

Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - Lead
   - Coupler
   - Connector
2. Check:
   - Lead
   - Coupler
   - Connector

   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.

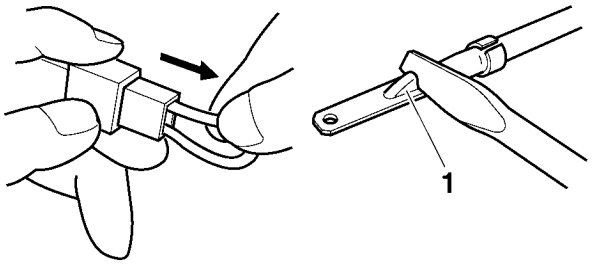


3. Check:
   - All connections

   Loose connection → Connect properly.

NOTE:

If the pin "1" on the terminal is flattened, bend it up.



4. Connect:
   - Lead
   - Coupler
   - Connector

NOTE:

Make sure all connections are tight.

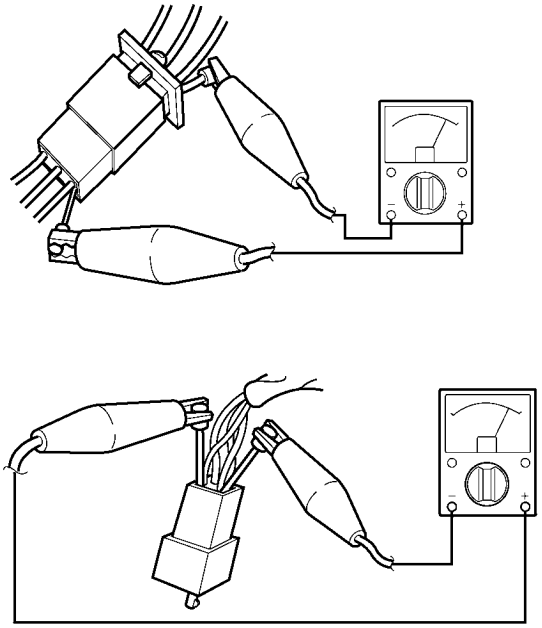
5. Check:
   - Continuity

   (with the pocket tester)

	Pocket tester **90890-03132**

NOTE:

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.



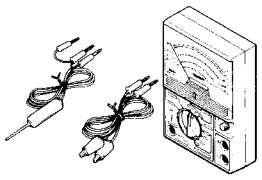
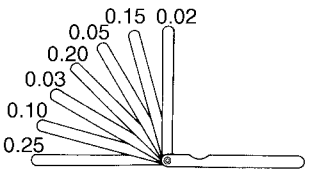
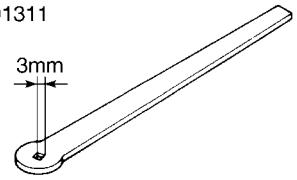
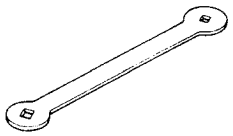
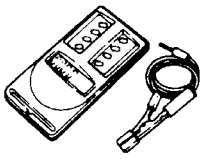
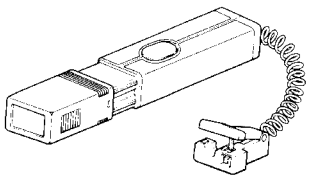
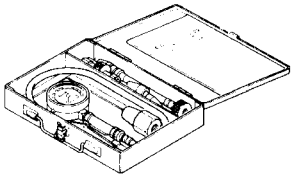
EAS20260

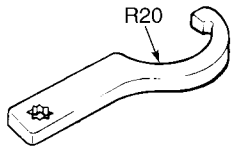
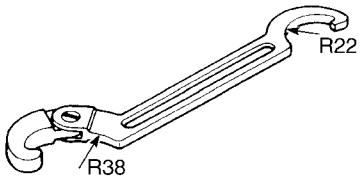
SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country. When placing an order, refer to the list provided below to avoid any mistakes.

NOTE:

For U.S.A. and Canada, use part number starting with "YM-", "YU-", or "ACC-".
For others, use part number starting with "90890-".

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03132		1-4, 3-7, 3-8, 5-52, 7-35, 7-36, 7-37, 7-40, 7-41, 7-42, 7-43, 7-44, 7-45, 7-47
Special thickness gauge 90890-01399		3-5
Tappet adjusting tool 90890-01311 Six piece tappet set YM-A5970	90890-01311  YM-08035-A 	3-6
Digital tachometer 90890-06760 YU-39951-B		3-7, 3-8, 3-11
Timing light 90890-03141 Inductive clamp timing light YU-03141		3-11
Compression gauge 90890-03081 Engine compression tester YU-33223		3-12

Tool name/Tool No.	Illustration	Reference pages
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-23
Ring nut wrench 90890-01268 Spanner wrench YU-01268		3-24, 4-49
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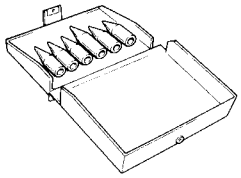
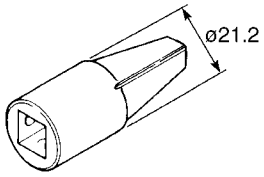
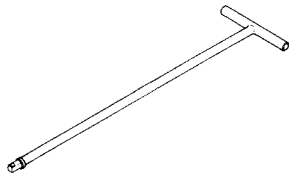
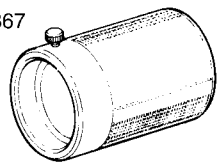
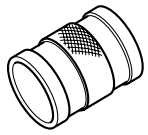
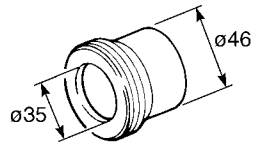
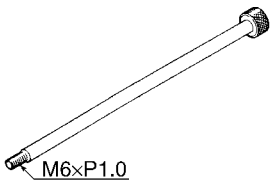
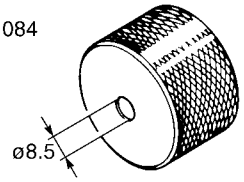
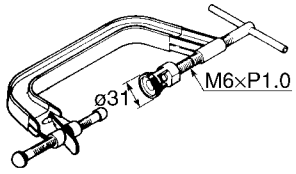
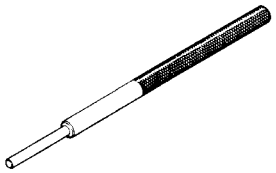
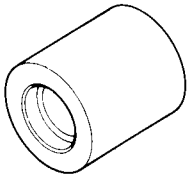
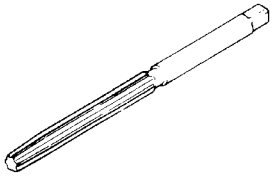
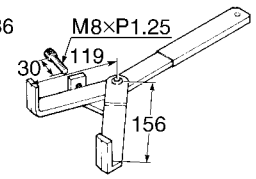
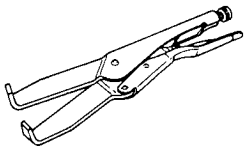
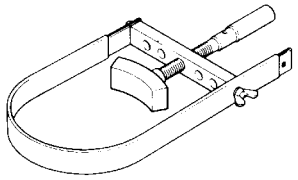
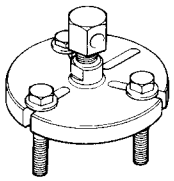
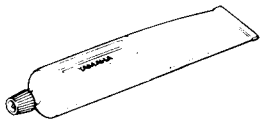
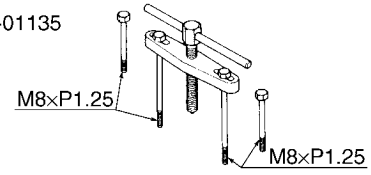
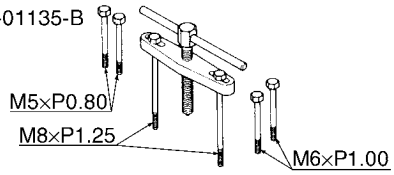
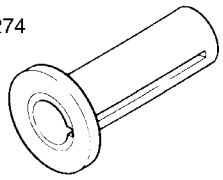
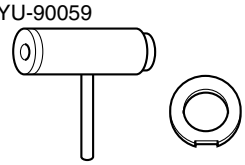
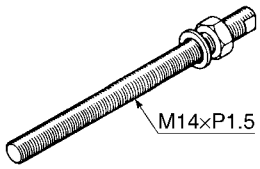
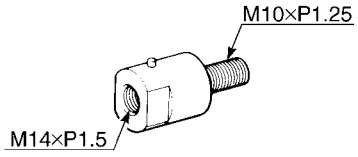
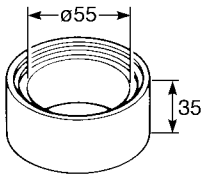
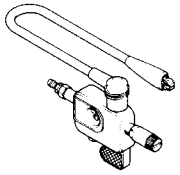
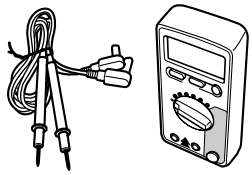
Cylinder cup installer 90890-01996		4-22, 4-33
Damper rod holder 90890-01460		4-42, 4-44
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-44
Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7	90890-01367  YM-A9409-7/YM-A5142-4 	4-44, 4-45

Tool name/Tool No.	Illustration	Reference pages
Fork seal driver attachment (ø35) 90890-01369 Replacement 35 mm YM-A9409-5		4-44
Slide hammer bolt 90890-01083 Slide hammer bolt 6 mm YU-01083-1		5-14
Weight 90890-01084 YU-01083-3	90890-01084  YU-01083-3 	5-14
Valve spring compressor 90890-04019 YM-04019		5-18, 5-23
Valve guide remover (ø6) 90890-04064 Valve guide remover (6.0 mm) YM-04064-A		5-20
Valve guide installer (ø6) 90890-04065 Valve guide installer (6.0 mm) YM-04065-A		5-20
Valve guide reamer (ø6) 90890-04066 Valve guide reamer (6.0 mm) YM-04066		5-20

Tool name/Tool No.	Illustration	Reference pages
Universal clutch holder 90890-04086 YM-91042	90890-04086  YM-91042 	5-33, 5-35
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-47, 5-48
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-47
Yamaha bond No. 1215 (Three Bond No.1215®) 90890-85505		5-56
Crankcase separating tool 90890-01135 Crankcase separator YU-01135-B	90890-01135  YU-01135-B 	5-59

Tool name/Tool No.	Illustration	Reference pages
Crankshaft installer pot 90890-01274 Installing pot YU-90058	90890-01274  YU-90058/YU-90059 	5-60
Crankshaft installer bolt 90890-01275 Bolt YU-90060		5-60
Adapter (M10) 90890-01383 Adapter #2 YU-90062		5-60
Spacer 90890-01288		5-60
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		7-43
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		7-46

SPECIFICATIONS

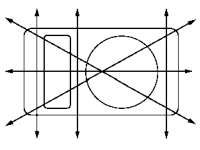
EAS20280

GENERAL SPECIFICATIONS

Model	
Model	3C58 (U49) 3C59 (CAL)
Dimensions	
Overall length	2150 mm (84.6 in)
Overall width	805 mm (31.7 in)
Overall height	1160 mm (45.7 in)
Seat height	810 mm (31.9 in)
Wheelbase	1360 mm (53.5 in)
Ground clearance	285 mm (11.22 in)
Minimum turning radius	1900 mm (74.8 in)
Weight	
With oil and fuel	132.0 kg (291 lb)
Maximum load	160.0 kg (353 lb)

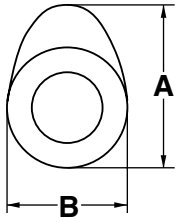
EAS20290
ENGINE SPECIFICATIONS

Engine	
Engine type	Air cooled 4-stroke, SOHC
Displacement	249.0 cm^3
Cylinder arrangement	Forward-inclined single cylinder
Bore × stroke	74.0 × 58.0 mm (2.91 × 2.28 in)
Compression ratio	9.50 :1
Starting system	Electric starter
Fuel	
Recommended fuel	Unleaded gasoline only
Fuel tank capacity	9.1 L (2.40 US gal) (2.00 Imp.gal) (CAL) 9.8 L (2.59 US gal) (2.16 Imp.gal) (U49)
Fuel reserve amount	1.9 L (0.50 US gal) (0.42 Imp.gal)
Engine oil	
Lubrication system	Wet sump
Type	YAMALUBE 4, SAE10W30 or SAE20W40
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	1.40 L (1.48 US qt) (1.23 Imp.qt)
Without oil filter element replacement	1.20 L (1.27 US qt) (1.06 Imp.qt)
With oil filter element replacement	1.30 L (1.37 US qt) (1.14 Imp.qt)
Oil filter type	Paper
Oil pump	
Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	0.150 mm (0.0059 in)
Limit	0.200 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.100–0.151 mm (0.0039–0.0059 in)
Limit	0.221 mm (0.0087 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.04–0.09 mm (0.0016–0.0035 in)
Limit	0.16 mm (0.0063 in)
Pressure check location	HEAD CYLINDER
Spark plug (s)	
Manufacturer/model	NGK/DR7EA
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Cylinder head	
Volume	20.50–21.50 cm^3 (1.25–1.31 cu.in)
Warpage limit	0.03 mm (0.0012 in)



Camshaft	
Drive system	Chain drive (right)
Camshaft journal diameter	25.021–25.039 mm (0.9851–0.9858 in)

Camshaft lobe dimensions	
Intake A	36.520–36.620 mm (1.4378–1.4417 in)
Limit	36.460 mm (1.4354 in)
Intake B	30.201–30.301 mm (1.1890–1.1930 in)
Limit	30.151 mm (1.1870 in)
Exhaust A	36.564–36.664 mm (1.4395–1.4435 in)
Limit	36.514 mm (1.4376 in)
Exhaust B	30.216–30.316 mm (1.1896–1.1935 in)
Limit	30.166 mm (1.1876 in)



Camshaft runout limit	0.030 mm (0.0012 in)

Timing chain

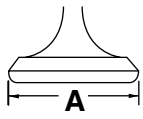
Model/number of links	DID SCR-0404 SV/104
Tensioning system	Automatic

Rocker arm/rocker arm shaft

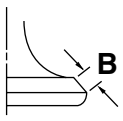
Rocker arm inside diameter	12.000–12.018 mm (0.4724–0.4731 in)
Limit	12.036 mm (0.4739 in)
Rocker arm shaft outside diameter	11.981–11.991 mm (0.4717–0.4721 in)
Limit	11.950 mm (0.4705 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.037 mm (0.0004–0.0015 in)

Valve, valve seat, valve guide

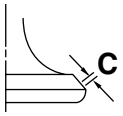
Valve clearance (cold)	
Intake	0.05–0.10 mm (0.0020–0.0039 in)
Exhaust	0.10–0.15 mm (0.0039–0.0059 in)
Valve dimensions	
Valve head diameter A (intake)	33.90–34.10 mm (1.3346–1.3425 in)
Valve head diameter A (exhaust)	28.40–28.60 mm (1.1181–1.1260 in)



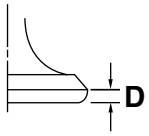
Valve face width B (intake)	2.260 mm (0.0890 in)
Valve face width B (exhaust)	2.260 mm (0.0890 in)



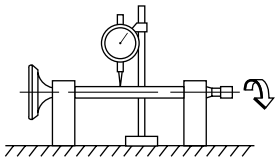
Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Valve seat width C (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)



Valve margin thickness D (intake)	0.80–1.20 mm (0.0315–0.0472 in)
Valve margin thickness D (exhaust)	0.80–1.20 mm (0.0315–0.0472 in)



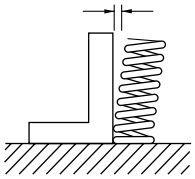
Valve stem diameter (intake)	5.975–5.990 mm (0.2352–0.2358 in)
Limit	5.950 mm (0.2343 in)
Valve stem diameter (exhaust)	5.960–5.975 mm (0.2346–0.2352 in)
Limit	5.935 mm (0.2337 in)
Valve guide inside diameter (intake)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.042 mm (0.2379 in)
Valve guide inside diameter (exhaust)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.042 mm (0.2379 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.030 mm (0.0012 in)



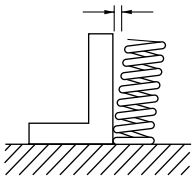
Cylinder head valve seat width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.7 mm (0.07 in)
Cylinder head valve seat width (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.7 mm (0.07 in)

Valve spring

Inner spring	
Free length (intake)	36.17 mm (1.42 in)
Limit	34.47 mm (1.36 in)
Free length (exhaust)	36.17 mm (1.42 in)
Limit	34.47 mm (1.36 in)
Installed length (intake)	30.50 mm (1.20 in)
Installed length (exhaust)	30.50 mm (1.20 in)
Spring rate K1 (intake)	14.70 N/mm (83.94 lb/in) (1.50 kgf/mm)
Spring rate K2 (intake)	19.00 N/mm (108.49 lb/in) (1.94 kgf/mm)
Spring rate K1 (exhaust)	14.70 N/mm (83.94 lb/in) (1.50 kgf/mm)
Spring rate K2 (exhaust)	19.00 N/mm (108.49 lb/in) (1.94 kgf/mm)
Installed compression spring force (intake)	75.00–91.70 N (16.86–20.61 lbf) (7.65–9.35 kgf)
Installed compression spring force (exhaust)	75.00–91.70 N (16.86–20.61 lbf) (7.65–9.35 kgf)
Spring tilt (intake)	2.5 °/1.6 mm
Spring tilt (exhaust)	2.5 °/1.6 mm



Winding direction (intake)	Counter clockwise
Winding direction (exhaust)	Counter clockwise
Outer spring	
Free length (intake)	36.63 mm (1.44 in)
Limit	34.63 mm (1.36 in)
Free length (exhaust)	36.63 mm (1.44 in)
Limit	34.63 mm (1.36 in)
Installed length (intake)	32.00 mm (1.26 in)
Installed length (exhaust)	32.00 mm (1.26 in)
Spring rate K1 (intake)	30.90 N/mm (176.44 lb/in) (3.15 kgf/mm)
Spring rate K2 (intake)	40.80 N/mm (232.97 lb/in) (4.16 kgf/mm)
Spring rate K1 (exhaust)	30.90 N/mm (176.44 lb/in) (3.15 kgf/mm)
Spring rate K2 (exhaust)	40.80 N/mm (232.97 lb/in) (4.16 kgf/mm)
Installed compression spring force (intake)	128.50–157.90 N (28.89–35.50 lbf) (13.10–16.10 kgf)
Installed compression spring force (exhaust)	128.50–157.90 N (28.89–35.50 lbf) (13.10–16.10 kgf)
Spring tilt (intake)	2.5 °/1.6 mm
Spring tilt (exhaust)	2.5 °/1.6 mm



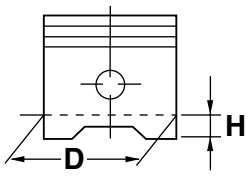
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise

Cylinder

Bore	74.000–74.016 mm (2.9134–2.9140 in)
Wear limit	74.100 mm (2.9173 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.010 mm (0.0004 in)
Warp limit	0.10 mm (0.0039 in)

Piston

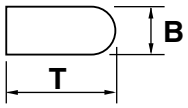
Piston-to-cylinder clearance	0.010–0.025 mm (0.0004–0.0010 in)
Limit	0.15 mm (0.0059 in)
Diameter D	73.983–73.998 mm (2.9127–2.9133 in)
Height H	11.0 mm (0.43 in)



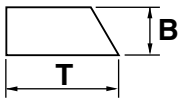
Offset	0.50 mm (0.0197 in)
Offset direction	Intake side
Piston pin bore inside diameter	16.002–16.013 mm (0.6300–0.6304 in)
Limit	16.043 mm (0.6316 in)
Piston pin outside diameter	15.991–16.000 mm (0.6296–0.6299 in)
Limit	15.971 mm (0.6288 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)

Piston ring

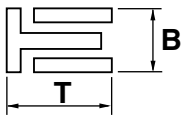
Top ring	
Ring type	Barrel
Dimensions (B × T)	0.90 × 2.75 mm (0.04 × 0.11 in)



End gap (installed)	0.19–0.31 mm (0.0075–0.0122 in)
Limit	0.56 mm (0.0220 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Limit	0.115 mm (0.0045 in)
2nd ring	
Ring type	Taper
Dimensions (B × T)	0.80 × 2.80 mm (0.03 × 0.11 in)

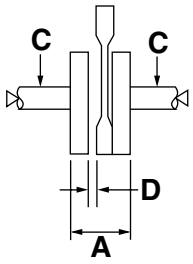


End gap (installed)	0.30–0.45 mm (0.0118–0.0177 in)
Limit	0.80 mm (0.0314 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Limit	0.115 mm (0.0045 in)
Oil ring	
Dimensions (B × T)	1.50 × 2.60 mm (0.06 × 0.10 in)



End gap (installed)	0.10–0.35 mm (0.0039–0.0138 in)

Crankshaft	
Width A	69.25–69.30 mm (2.726–2.728 in)
Runout limit C	0.030 mm (0.0012 in)
Big end side clearance D	0.350–0.850 mm (0.0138–0.0335 in)



Balancer	
Balancer drive method	Gear
Clutch	
Clutch type	Wet, multiple-disc
Clutch release method	Inner push, cam push
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate thickness	2.70–2.90 mm (0.106–0.114 in)
Wear limit	2.60 mm (0.1024 in)
Plate quantity	6 pcs
Clutch plate thickness	1.50–1.70 mm (0.059–0.067 in)
Plate quantity	5 pcs
Warpage limit	0.20 mm (0.0079 in)
Clutch spring free length	40.10 mm (1.58 in)
Limit	38.10 mm (1.50 in)
Spring quantity	5 pcs
Clutch housing thrust clearance	0.100–0.350 mm (0.0039–0.0138 in)
Clutch housing radial clearance	0.010–0.044 mm (0.0004–0.0017 in)
Push rod bending limit	0.500 mm (0.0197 in)
Transmission	
Transmission type	Constant mesh 5-speed
Primary reduction system	Spur gear
Primary reduction ratio	74/24 (3.083)
Secondary reduction system	Chain drive
Secondary reduction ratio	48/15 (3.200)
Operation	Left foot operation
Gear ratio	
1st	37/13 (2.846)
2nd	29/16 (1.812)
3rd	29/22 (1.318)
4th	29/28 (1.035)
5th	23/28 (0.821)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)
Main axle assembly width	102.20–102.40 mm (4.02–4.03 in)
Shifting mechanism	
Shift mechanism type	Shift drum and guide bar
Shift fork thickness	4.76–4.89 mm (0.1874–0.1925 in)

Air filter	
Air filter element	Oil-coated paper element
Carburetor	
Type × quantity	MV33 x 1
Manufacturer	TEIKEI
ID mark	3C58 00 (U49) 3C59 00 (CAL)
Main jet	#135
Main air jet	1.20
Jet needle	5A21-1
Needle jet	2.585
Pilot air jet 1	0.90
Pilot outlet	0.8x1.2
Pilot jet	#34
Bypass 1	0.8
Bypass 2	0.8
Bypass 3	0.8
Bypass 4	0.8
Pilot screw turn out	2–1/2
Valve seat size	0.50
Starter jet 1	#90
Starter jet 2	#78
Throttle valve size	33
Float height	11.9 mm (0.47 in)
Idling condition	
Engine idling speed	1300–1500 r/min
CO%	0.5–1.5 %
Intake vacuum	29.0–37.0 kPa (8.6–10.9 inHg) (218–278 mm-Hg)
Oil temperature	95.0–105.0 °C (203.00–221.00 °F)
Throttle cable free play	3.0–5.0 mm (0.12–0.20 in)

EAS20300
CHASSIS SPECIFICATIONS

Chassis	
Frame type	Semi double cradle
Caster angle	26.42 °
Trail	106.0 mm (4.17 in)
Front wheel	
Wheel type	Spoke wheel
Rim size	21x1.60
Rim material	Aluminum
Wheel travel	225.0 mm (8.86 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Rear wheel	
Wheel type	Spoke wheel
Rim size	18M/C x MT2.15
Rim material	Aluminum
Wheel travel	180.0 mm (7.09 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Front tire	
Type	With tube
Size	2.75-21 45P
Manufacturer/model	CHENG SHIN/C-6006
Manufacturer/model	DUNLOP/D605F
Wear limit (front)	0.8 mm (0.03 in)
Rear tire	
Type	With tube
Size	120/80-18M/C 62P
Manufacturer/model	CHENG SHIN/C-6006
Manufacturer/model	DUNLOP/D605
Wear limit (rear)	0.8 mm (0.03 in)
Tire air pressure (measured on cold tires)	
Loading condition	0–90 kg (0–198 lb)
Front	125 kPa (18 psi) (1.25 kgf/cm^2)
Rear	150 kPa (22 psi) (1.50 kgf/cm^2)
Loading condition	90 kg–Maximum load
Front	150 kPa (22 psi) (1.50 kgf/cm^2)
Rear	175 kPa (25 psi) (1.75 kgf/cm^2)
Front brake	
Type	Single disc brake
Operation	Right hand operation
Front brake lever free play	2.0–5.0 mm (0.08–0.20 in)
Front disc brake	
Disc outside diameter × thickness	245.0 × 3.5 mm (9.65 × 0.14 in)
Brake disc thickness limit	3.0 mm (0.12 in)

Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.3 mm (0.21 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	5.3 mm (0.21 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	11.00 mm (0.43 in)
Caliper cylinder inside diameter	26.99 mm (1.06 in)
Caliper cylinder inside diameter	22.22 mm (0.87 in)
Recommended fluid	DOT 4
Rear brake	
Type	Single disc brake
Operation	Right foot operation
Brake pedal position	20.0 mm (0.79 in)
Rear disc brake	
Disc outside diameter × thickness	203.0 × 4.5 mm (7.99 × 0.18 in)
Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.2 mm (0.20 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	5.2 mm (0.20 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	30.23 mm (1.19 in)
Recommended fluid	DOT 4
Steering	
Steering bearing type	Taper roller bearing
Center to lock angle (left)	51.0 °
Center to lock angle (right)	51.0 °
Front suspension	
Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	225.0 mm (8.86 in)
Fork spring free length	482.0 mm (18.98 in)
Limit	472.3 mm (18.59 in)
Installed length	472.2 mm (18.59 in)
Spring rate K1	3.65 N/mm (20.84 lb/in) (0.37 kgf/mm)
Spring stroke K1	0.0–225.0 mm (0.00–8.86 in)
Optional spring available	No
Recommended oil	Yamaha fork oil 15WT
Quantity	385.0 cm^3 (13.02 US oz) (13.58 Imp.oz)
Level	125.0 mm (4.92 in)
Swingarm	
Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	1.0 mm (0.04 in)
Drive chain	
Type/manufacturer	428V/DAIDO
Link quantity	128
Drive chain slack	40.0–45.0 mm (1.57–1.77 in)
15-link length limit	191.5 mm (7.54 in)

EAS20310
ELECTRICAL SPECIFICATIONS

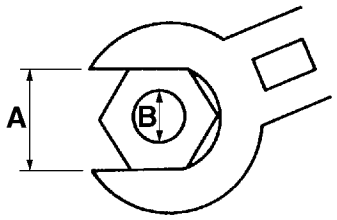
Voltage	
System voltage	12 V
Ignition system	
Ignition system	CDI
Advancer type	Digital
Ignition timing (B.T.D.C.)	10.0 °/1400 r/min
CDI	
Magneto model/manufacturer	F5XT/YAMAHA
Pickup coil resistance	248–372 Ω (Red–white)
CDI unit model/manufacturer	3C5/YAMAHA
Ignition coil	
Model/manufacturer	2JN/YAMAHA
Minimum ignition spark gap	6.0 mm (0.24 in)
Primary coil resistance	0.18–0.28 Ω
Secondary coil resistance	6.32–9.48 kΩ
Spark plug cap	
Material	Resin
Resistance	10.0 kΩ
AC magneto	
Model/manufacturer	F5XT/YAMAHA
Standard output	14.0 V, 190 W@5000 r/min
Stator coil resistance	0.688–1.032 Ω (White–white)
Rectifier/regulator	
Regulator type	Semi conductor-short circuit
Model/manufacturer	SH629A-12/SHINDENGEN
No load regulated voltage	14.1–14.9 V
Rectifier capacity	10.0 A
Withstand voltage	200.0 V
Battery	
Model	YTZ7S
Voltage, capacity	12 V, 6.0 Ah
Specific gravity	1.310
Manufacturer	GS YUASA
Ten hour rate amperage	0.60 A
Headlight	
Bulb type	Halogen bulb
Bulb voltage, wattage × quantity	
Headlight	12 V, 60 W/55.0 W × 1
Tail/brake light	12 V, 8.0 W/27.0 W × 1
Front turn signal/position light	12 V, 27 W/5.0 W × 2
Rear turn signal light	12 V, 27.0 W × 2
License plate light	12 V, 8.0 W × 1
Indicator light	
Neutral indicator light	LED
Turn signal indicator light	LED
High beam indicator light	LED

Electric starting system	
System type	Constant mesh
Starter motor	
Model/manufacturer	3C5/YAMAHA
Power output	0.40 kW
Armature coil resistance	0.0126–0.0154 Ω
Brush overall length	10.0 mm (0.39 in)
Limit	3.50 mm (0.14 in)
Brush spring force	5.52–8.28 N (19.87–29.80 oz) (563–844 gf)
Commutator diameter	22.0 mm (0.87 in)
Limit	21.0 mm (0.83 in)
Mica undercut (depth)	1.50 mm (0.06 in)
Starter relay	
Model/manufacturer	2768096-A/JIDECO
Amperage	180.0 A
Coil resistance	4.18–4.62 Ω
Horn	
Horn type	Plane
Quantity	1 pcs
Model/manufacturer	HF-12/NIKKO
Maximum amperage	3.0 A
Coil resistance	1.01–1.11 Ω
Performance	108–116 dB/2m
Turn signal relay	
Relay type	Full transistor
Model/manufacturer	FE218BH/DENSO
Built-in, self-canceling device	No
Turn signal blinking frequency	75–95 cycles/min
Starting circuit cut-off relay	
Model/manufacturer	ACM33211 M04/MATSUSHITA
Coil resistance	86.4–105.6 Ω
Carburetor warmer resistance	4.7–9.5 W 20°C (68°F)
Fuses	
Main fuse	20.0 A
Spare fuse	20.0 A

EAS20320
TIGHTENING TORQUES

EAS20330
GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A. Distance between flats
B. Outside thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

EAS20340
ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Camshaft sprocket cover bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Timing chain tensioner bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Intake manifold bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Air induction system pipe	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Cylinder bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Clutch cover bolt	M6	13	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil filter element drain bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Generator rotor cover bolt	M6	9	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Speed sensor bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Crankcase bolt	M6	12	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Cylinder head bolt (226 mm)	M8	4	22 Nm (2.2 m•kg, 16 ft•lb)	
Cylinder head bolt (45 mm)	M8	2	20 Nm (2.0 m•kg, 15 ft•lb)	
Camshaft retainer bolt	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	LT
Tappet cover	M55	2	18 Nm (1.8 m•kg, 13 ft•lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Breather plate bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT
Spark plug	M12	1	18 Nm (1.8 m•kg, 13 ft•lb)	
Exhaust pipe stud bolt	M8	2	15 Nm (1.5 m•kg, 11 ft•lb)	
Oil check bolt	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Generator rotor bolt	M10	1	60 Nm (6.0 m•kg, 43 ft•lb)	
Balancer driven gear nut	M12	1	55 Nm (5.5 m•kg, 40 ft•lb)	lock washer use
Locknut (valve clearance adjusting screw)	M6	2	14 Nm (1.4 m•kg, 10 ft•lb)	
Camshaft sprocket bolt	M10	1	60 Nm (6.0 m•kg, 43 ft•lb)	
Timing chain tensioner cap bolt	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Timing chain guide (intake side)	M6	2	8 Nm (0.8 m•kg, 5.8 ft•lb)	LT
Oil filter element cover bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil delivery pipe bolt	M10	1	20 Nm (2.0 m•kg, 15 ft•lb)	
Oil delivery pipe bolt	M8	1	17 Nm (1.7 m•kg, 12 ft•lb)	
Oil pump cover screw	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Oil pump assembly bolt	M6	3	6 Nm (0.6 m•kg, 4.3 ft•lb)	LT
Air filter case bolt	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	LT
Air cut-off valve bolt	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Exhaust pipe joint bolt	M8	1	20 Nm (2.0 m•kg, 15 ft•lb)	
Exhaust pipe nut	M8	2	18 Nm (1.8 m•kg, 13 ft•lb)	
Muffler bolt	M8	2	42 Nm (4.2 m•kg, 30 ft•lb)	
Stator assembly lead holder bolt	M5	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	LT
Engine oil drain bolt	M12	1	20 Nm (2.0 m•kg, 15 ft•lb)	
Clutch cable holder bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Neutral switch lead holder bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Starter clutch idle gear cover bolt	M6	3	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Bearing retainer	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT
Starter clutch bolt	M8	3	30 Nm (30. m•kg, 22 ft•lb)	LT
Primary drive gear nut	M16	1	80 Nm (8.0 m•kg, 58 ft•lb)	lock washer use

Item	Thread size	Q'ty	Tightening torque	Remarks
Clutch boss nut	M16	1	75 Nm (7.5 m•kg, 54 ft•lb)	lock washer use
Clutch spring bolt	M6	5	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Lock nut (Push lever adjusting screw)	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Push lever holding bolt	M8	1	12 Nm (1.2 m•kg, 8.7 ft•lb)	
Drive sprocket nut	M18	1	110 Nm (11.0 m•kg, 80 ft\•lb)	lock washer use
Stopper lever bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT
Neutral switch	M10	1	20 Nm (2.0 m•kg, 15 ft•lb)	
Starter motor bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Pickup coil bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT
Stator assembly bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT

EAS20350
CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine mounting nut	M10	3	60 Nm (6.0 m•kg, 43 ft•lb)	
Engine bracket nut	M8	2	44 Nm (4.4 m•kg, 32 ft•lb)	
Down tube nut	M10	5	60 Nm (6.0 m•kg, 43 ft•lb)	
Drive chain tensioner bolt	M8	1	23 Nm (2.3 m•kg, 17 ft•lb)	
Mudguard bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Front fender bolt	M6	4	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Grab bar bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Rear side cover bolt	M6	2	9 Nm (0.9 m•kg, 6.5 ft•lb)	
Tool box bolt	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Horn bracket bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Battery/Electrical box bolt	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Starter motor lead bolt	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Ignition coil bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Pivot shaft nut	M12	1	80 Nm (8.0 m•kg, 58 ft•lb)	
Rear shock absorber assembly upper nut	M12	2	50 Nm (5.0 m•kg, 36 ft•lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Relay arm nut (frame side)	M12	2	50 Nm (5.0 m•kg, 36 ft•lb)	
Steering stem nut	M22	1	110 Nm (11.0 m•kg, 80 ft•lb)	
Lower ring nut	M22	1	–	See NOTE
Fuel tank bolt	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Brake hose union bolt	M10	3	30 Nm (3.0 m•kg, 22 ft•lb)	
Brake hose holding bolt	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Front brake hose holding bolt (holder and lower bracket)	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Handlebar holder bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Sidestand nut	M10	1	44 Nm (4.0 m•kg, 32 ft•lb)	
Brake pedal bolt	M10	1	30 Nm (30. m•kg, 22 ft•lb)	
Rear brake caliper cover	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear brake master cylinder bolt	M6	2	13 Nm (1.3 m•kg, 9.4 ft•lb)	
Passenger footrest bracket bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Upper bracket pinch bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Meter stay bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Headlight unit bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear shock absorber assembly lower nut	M10	2	40 Nm (4.0 m•kg, 29 ft•lb)	
Connecting arm bolt (relay arm side)	M12	1	59 Nm (5.9 m•kg, 43 ft•lb)	
Connecting arm bolt (swingarm side)	M12	1	59 Nm (5.9 m•kg, 43 ft•lb)	
Rear drive chain guide bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	LT
Lower bracket pinch bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Front fork cap bolt	M30	2	23 Nm (2.3 m•kg, 17 ft•lb)	
Damper rod bolt	M8	2	18 Nm (1.8 m•kg, 13 ft•lb)	LT
Front wheel axle nut	M14	1	85 Nm (8.5 m•kg, 62 ft•lb)	
Front brake disc bolt	M6	6	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT
Front brake caliper bracket bolt	M10	2	40 Nm (4.0 m•kg, 29 ft•lb)	
Front brake caliper support bolt	M10	2	32 Nm (3.2 m•kg, 23 ft•lb)	
Bleed screw	M7	2	6 Nm (0.6 m•kg, 4.3 ft•lb)	
Rear wheel axle nut	M14	1	85 Nm (8.5 m•kg, 62 ft•lb)	
Rear wheel sprocket self-locking nut	M8	1	33 Nm (3.3 m•kg, 24 ft•lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Rear brake disc bolt	M8	3	28 Nm (2.8 m•kg, 21 ft•lb)	LT
Front brake master cylinder holder bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Front brake lever nut	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear brake hose joint (caliper side)	M10	1	26 Nm (2.6 m•kg, 19 ft•lb)	
Rear brake hose joint (hose side)	M10	1	14 Nm (1.4 m•kg, 10 ft•lb)	
Rear brake pad support bolt	M10	2	17 Nm (1.7 m•kg, 12 ft•lb)	

NOTE:

- Tighten the lower ring nut with the specified torque (38 Nm (3.8 m•kg, 28 ft•lb)).
- Check the front fork leg operates smoothly by turning it to the right and left.
- Loosen the lower ring nut completely and retighten it with the specified torque (4 Nm (0.4 m•kg, 2.9 ft•lb)).

EAS20360
LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370
ENGINE

Lubrication point	Lubricant
Oil seal lips	LS
All O-rings	LS
All bearing retainers	E
Seat surface of cylinder head bolt (226 mm)	E
Threaded portion of cylinder head bolt (226 mm)	M
Cylinder inner surface	E
Crankshaft pin surface	E
Thrust end surface of connecting rod big end	E
Piston pin surface	E
Piston surface	E
Buffer boss surface	E
Valve stem (intake/exhaust)	M
Valve stem end (intake/exhaust)	M
Rocker arm shaft surface (intake/exhaust)	E
Camshaft profile	M
Rocker arm inner surface (intake/exhaust)	M
Inside of oil pump assembly	E
Oil pump gasket	LS
Starter clutch idle gear 1	E
Starter clutch idle gear 2	E
Starter clutch gear	E
Clutch push rod surface, and surface end	LS
Adjusting screw surface, and surface end (push lever)	LS
Primary driven gear (clutch housing)	E
Push lever shaft surface	E

Lubrication point	Lubricant
Ball surface (clutch push rod)	LS
Main axle assembly	M
Drive axle assembly	M
Shift fork guide bar	E
Shift drum assembly	E
Shift shaft assembly	E
Shift pedal (bolt mount inner surface)	LS
Crankcase mating surface	Yamaha bond No. 1215 (Three Bond No. 1215®)
Threaded portion of starter motor bolt	Yamaha bond No. 1215 (Three Bond No. 1215®)

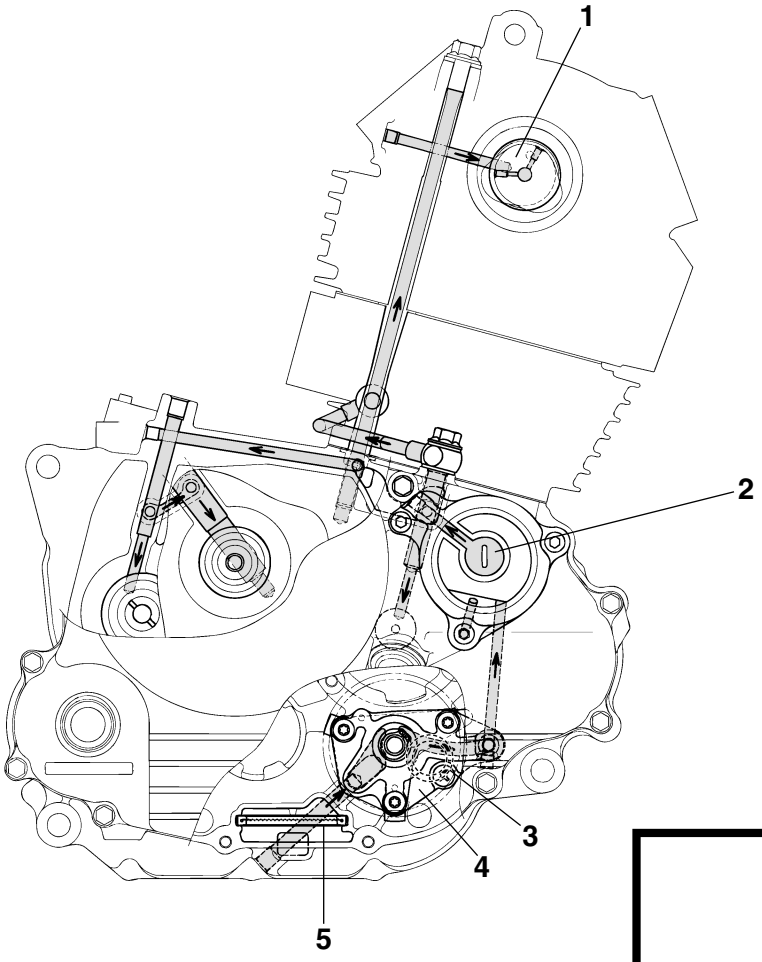
EAS20380
CHASSIS

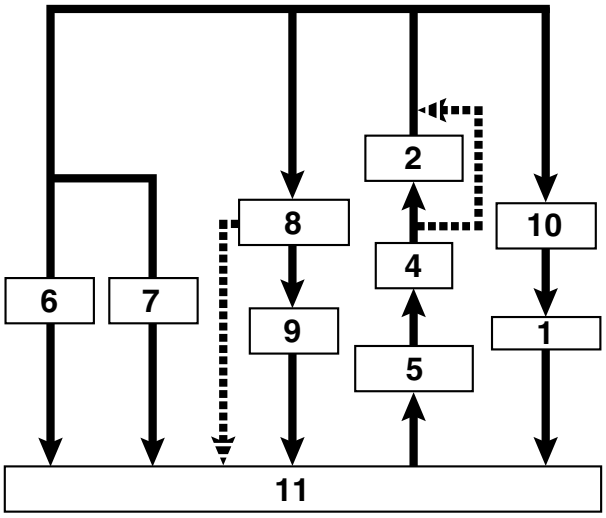
Lubrication point	Lubricant
Upper bearings and oil seal lip (steering head)	LS
Lower bearings and oil seal lip (steering head)	LS
Front wheel oil seal lip (left/right)	LS
Rear wheel oil seal lip (left/right)	LS
Brake pedal bolt shaft	LS
Throttle grip and throttle cable end	LS
Throttle cable housing inner surface	LS
Brake lever bolt shaft	S
Brake lever and front brake master cylinder moving parts	S
Adjusting screw end (brake lever)	S
Rear brake master cylinder pushrod (boot mount groove)	S
Brake caliper piston seal	S
Brake caliper support bolt shaft	S
Brake pad support bolt shaft	S

Lubrication point	Lubricant
Clutch lever cable mount	LS
Clutch lever bolt shaft	LS
Clutch lever moving parts	LS
Pivot shaft surface	M
Swing arm bushing, spacer, and oil seal lip	M
Relay arm bushing, spacer, and oil seal lip	M
Relay arm bolt shaft (on the frame and connecting arm)	M
Relay arm bolt shaft	M
Connecting arm bolt shaft	M
Lower bolt shaft of rear shock absorber assembly	M
Rear wheel axle surface	LS
Sidestand switch end and contact	LS
Frame and sidestand link moving parts	LS
Sidestand bolt collar surface	LS
Drive chain roller collar surface	LS
Tandem footrest moving parts	LS

EAS20390
LUBRICATION SYSTEM CHART AND DIAGRAMS

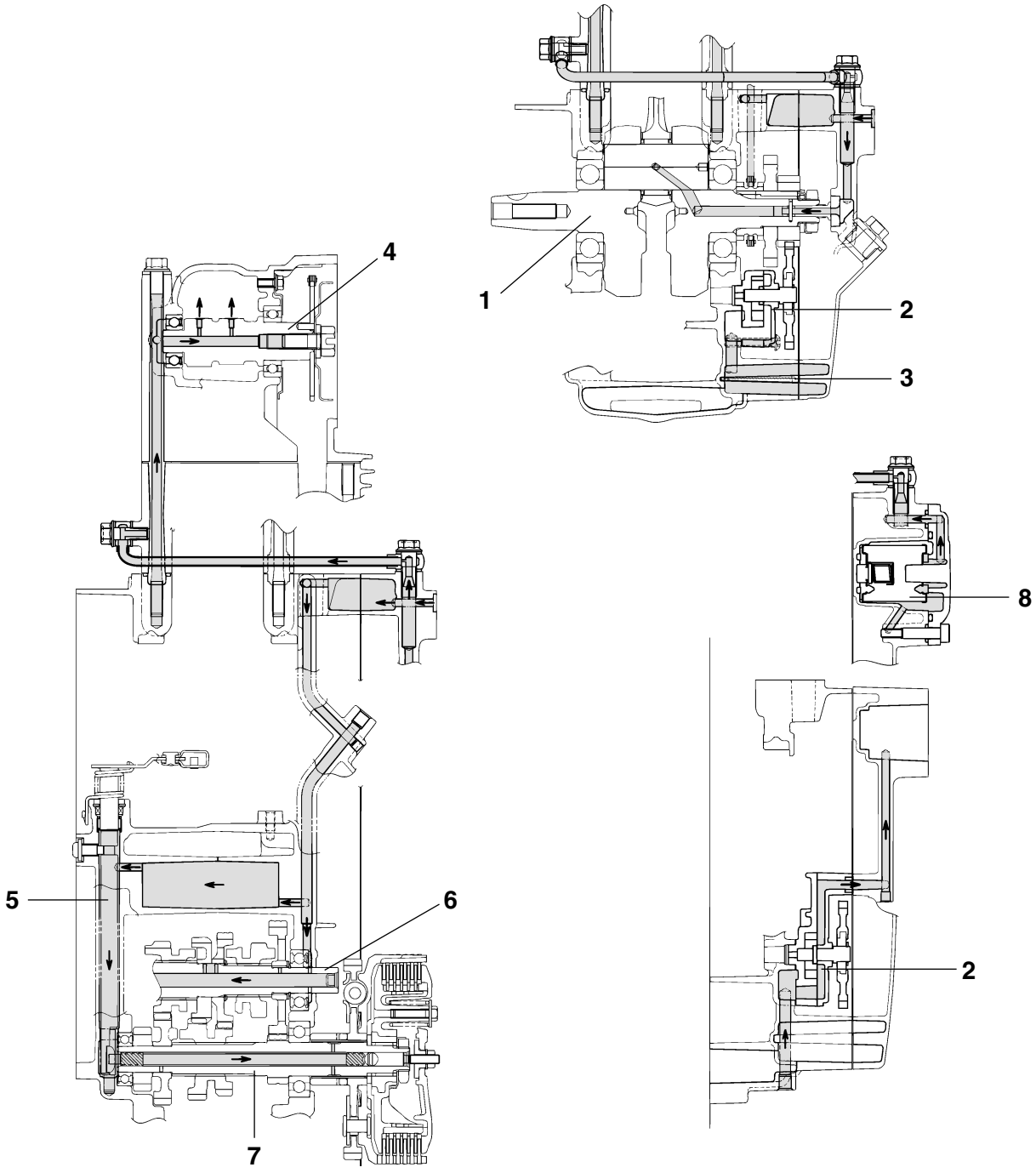
EAS20400
ENGINE OIL LUBRICATION CHART





1. Camshaft
2. Oil filter element
3. Oil level check window
4. Oil pump assembly
5. Oil strainer
6. Drive axle
7. Main axle
8. Plunger pin
9. Crankshaft
10. Cylinder head
11. Oil pan

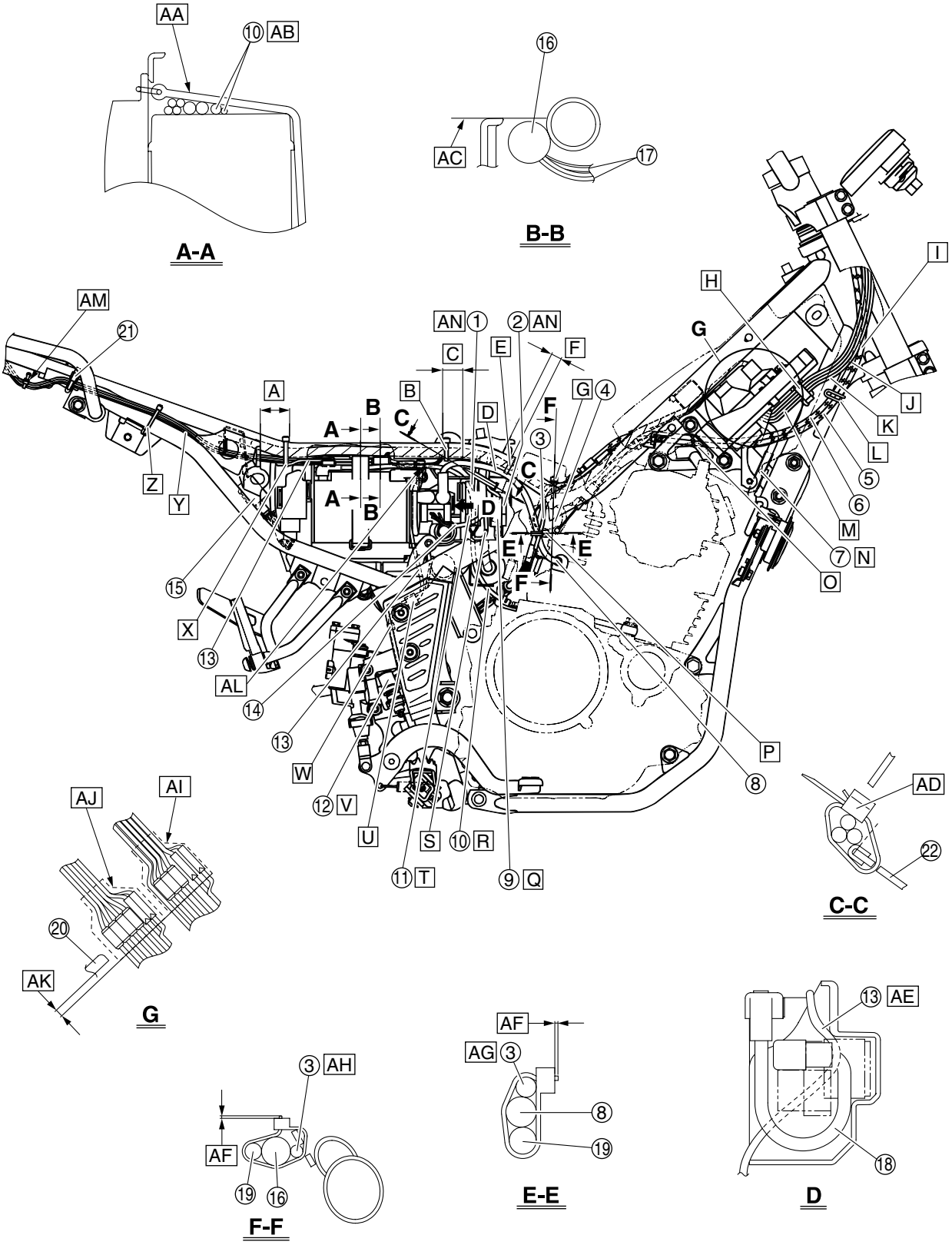
EAS20410
LUBRICATION DIAGRAMS



1. Crankshaft
2. Oil pump assembly
3. Oil strainer
4. Camshaft
5. Push lever shaft
6. Drive axle
7. Main axle
8. Oil filter element

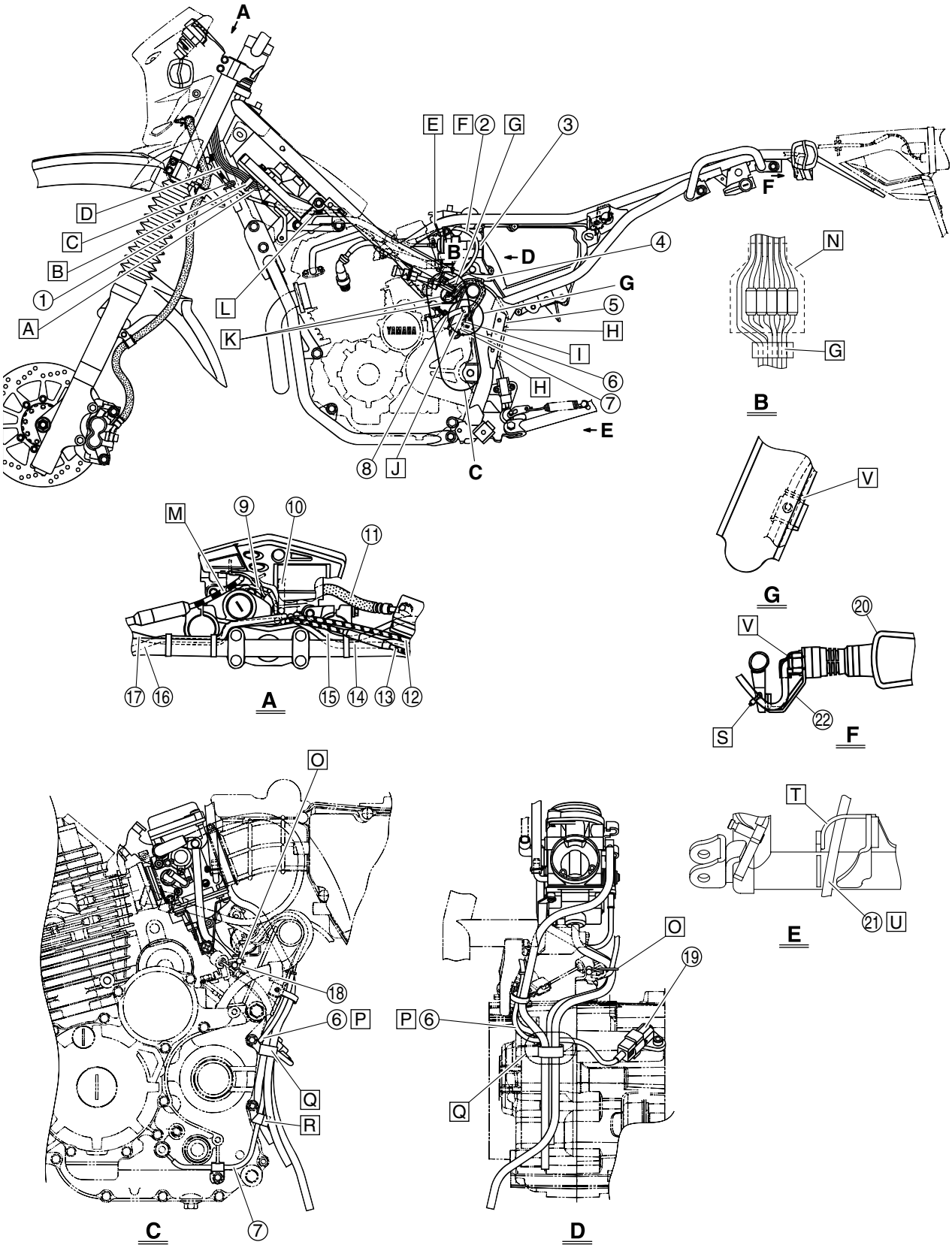
EAS20430

CABLE ROUTING



1. Headlight relay (lead having gray tape)
2. Starting circuit cut-off relay
3. Carburetor warmer lead
4. Throttle pulley
5. Throttle cable (decelerator cable)
6. Throttle cable (accelerator cable)
7. Horn lead
8. Starter motor lead
9. Diode1
10. Negative battery lead
11. Diode3
12. Rear brake light switch
13. Rear brake light switch lead
14. Starter relay lead
15. Turn signal relay
16. Wire harness
17. Rear turn signal light leads (left/right)
18. Positive battery lead
19. Clutch cable
20. Toolbox
21. Clamp
22. Battery box

A. 35 mm (1.38 in)
B. Clamp the wire harness using plastic locking tie. Face the cable tie end upwards, and cut off the excess end of the tie. When clamping, locate the connection of relay leads below the seat rails, but at the side of the fuel tank bracket (rear fuel tank bolt mount).
C. 30 mm (1.18 in)
D. Route the starter motor cable outside each lead.
E. Clamp the wire harness using a plastic locking tie. Face the plastic locking tie end upwards, and cut off the excess end of the tie.
F. 30 mm (1.18 in)
G. Clamp the wire harness, clutch cable, and carburetor warmer lead using plastic locking tie. Enter the cable tie in the frame opening. Face the cable tie end upwards, and cut off the excess end of the tie.
H. Secure the right handlebar switch lead, front brake light switch lead, right front turn signal light lead, and meter assembly leads using clamp. Face the clamp opening downwards.
I. Route the throttle cable inside of each lead.
J. Route each lead without slack.
K. Route the leads from the cutout of front right sidecover to inside of the sidecover.
L. Pass the throttle cable through the guide.
M. Each lead should not be exposed to the outside of the right front sidecover.
N. Pass the horn lead inside of the throttle cable and secure it to the T-stud of the frame.
O. Route the throttle cable above the cylinder head breather hose.
P. Clamp the clutch cable, starter motor lead, and carburetor warmer lead using plastic locking tie. Face the cable tie end outwards and cut off the excess end of the tie. Take care not to make the latchet face inwards towards the vehicle.
Q. Install diode 1 in the battery/electric parts box.
R. Pass the negative battery lead behind the wire harness. Also, pass the battery lead from the battery/electric parts box through the inside of the vehicle.
S. Gray tape (headlight relay lead)
T. Install diode 3 in front of the headlight relay.
U. Clamp the rear brake light switch lead using clamps. Face the clamp opening inwards .
V. Pass the rear brake light switch lead along the frame, and install the rear brake light switch.
W. Secure the rear brake light switch lead to the frame using clamps.
X. Clamp the wire harness, tail/brake light leads, rear turn signal light leads (left and right), and rear brake light switch lead using plastic locking tie. Face the end of the locking tie upward and cut off the excess end of the tie.
Y. Route leads between the frames and inside of the vehicle as shown in the illustration.
Z. Pass a plastic locking tie through the front side hole of the frame bracket and then clamp the rear turn signal light leads (left and right) and tail/brake light leads. Face the end of the locking tie upward and cut off the excess end of the locking tie.
AA. Route the rear turn signal light leads (left and right), tail/brake light leads, and rear brake light switch lead under the battery band.
AB. Route the negative battery lead outside other leads.
AC. Do not route the rear turn signal light leads (left and right) above the top panel of the battery/electric parts box.
AD. Clamp the starter relay lead, headlight relay lead, starting circuit cut-off relay lead, diode1 lead, and diode3 lead using plastic locking tie. Insert the latchet and the excess tail of the cable tie into the inside.
AE. Pass the rear brake light switch lead between the battery/electric parts box and the positive battery lead.
AF. Less than 2 mm (0.08 in)
AG. Route the carburetor warmer lead outside the clutch cable and starter motor lead.
AH. Route the carburetor warmer lead outside the wire harness.
AI. Pass the left handlebar switch lead, clutch switch lead, main switch lead, and front left turn signal light lead through the boot. Push and hold the boot onto the coupler end.
AJ. Pass the horn lead, meter assembly lead, right handlebar switch lead, front brake light switch lead, and front right turn signal light lead through the boot. Push and hold the boot onto the coupler end.
AK. The boot should be located under the toolbox end.
AL. Clamp the rear brake switch lead, taillight lead and two negative battery leads using plastic locking tie. The cable tie end should face downward. Do not clamp the couplers.
AM. Pass a plastic locking tie through the hole of frame gasset and then clamp the rear turn signal light leads and tail light lead. Face the end of the locking tie upward and cut off the excess end of the locking tie.
AN. The relay with the diode is front side and the relay with gray tape is rear side.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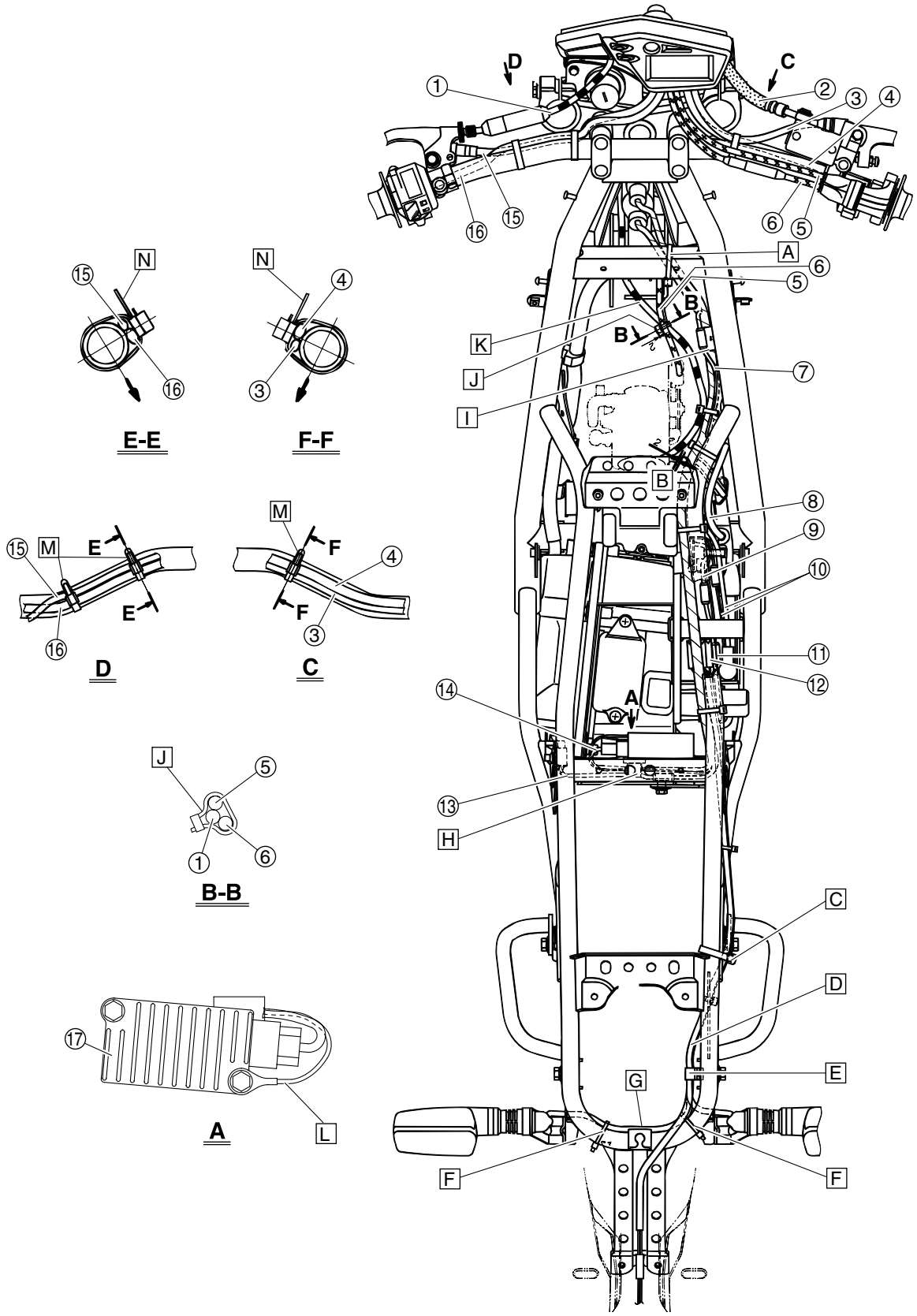
1. Clutch cable
2. Starter cable
3. Air induction system hose (from air filter case to air cut-off valve)
4. Cylinder head breather hose
5. Sidestand switch lead
6. Speed sensor lead
7. Neutral switch lead
8. Stator assembly lead
9. Main switch lead
10. Meter assembly leads
11. Front brake hose
12. Throttle cable (decelerator cable)
13. Throttle cable (accelerator cable)
14. Right handlebar switch lead
15. Front brake light switch lead
16. Left handlebar switch lead
17. Clutch switch lead
18. Negative battery lead
19. Speed sensor
20. Rear turn signal light
21. Carburetor fuel drain hose
22. Rear turn signal light bracket

A. Each lead should not be exposed to the outside of the front left sidecover.
B. Secure the left handlebar switch lead, clutch switch lead, front left turn signal light lead, and main switch lead using clamp. Face the clamp opening downwards.
C. Pass the clutch cable through the guide.
D. Enter each lead from the cutout of front left sidecover and run inside of the sidecover. Install each lead above the clutch cable without slack.
E. Clamp the starter cable using plastic locking tie and cut off the excess end of the tie. Face the end of the tie downwards.
F. Pass the starter cable through the square shape of air cut-off valve bracket, and route outside the air induction system hose (from air filter case to air cut-off valve) and cylinder head breather hose.
G. Secure the ignition coil lead, stator assembly lead, sidestand switch lead, neutral switch lead, and speed sensor lead using clamp. Face the clamp opening upward.
H. Secure the sidestand switch lead to the frame using clamps.
I. Secure the neutral switch lead and speed sensor lead using clamp. Face the clamp opening backward.
J. Secure the stator assembly lead using clamps. The clamp opening should face downwards away from the vehicle.
K. Secure the wire harness boot onto the guide.
L. Route the clutch cable above the cylinder head breather hose.
M. Route the clutch cable at the rear of the guide.
N. Pass the ignition coil lead, stator assembly lead, sidestand switch lead, neutral switch lead, and speed sensor lead through the boot. Insert all couplers into the boot.
O. Secure two carburetor air vent hoses, carburetor fuel drain hose, and negative battery lead using clamp. Face the clamp holders on the left of the vehicle.
P. Pass the speed sensor lead between each hose and the crankcase.
Q. Secure two carburetor air vent hoses, carburetor fuel drain hose, and neutral switch lead using clamp.
R. Secure the neutral switch lead using clamp.
S. Pass the rear turn signal light leads (left and right) through the opening of rear turn signal light bracket, and secure the leads using plastic locking tie. Face the cable tie end inward, and cut off the excess end of the tie.
T. Route the carburetor fuel drain hose through the guide.
U. Route the carburetor fuel drain hose through the rear of frame cross tube as shown in the illustration.(Except for California)
V. Using plastic locking tie, secure the neutral switch lead and speed sensor lead onto the clamp as shown in the illustration.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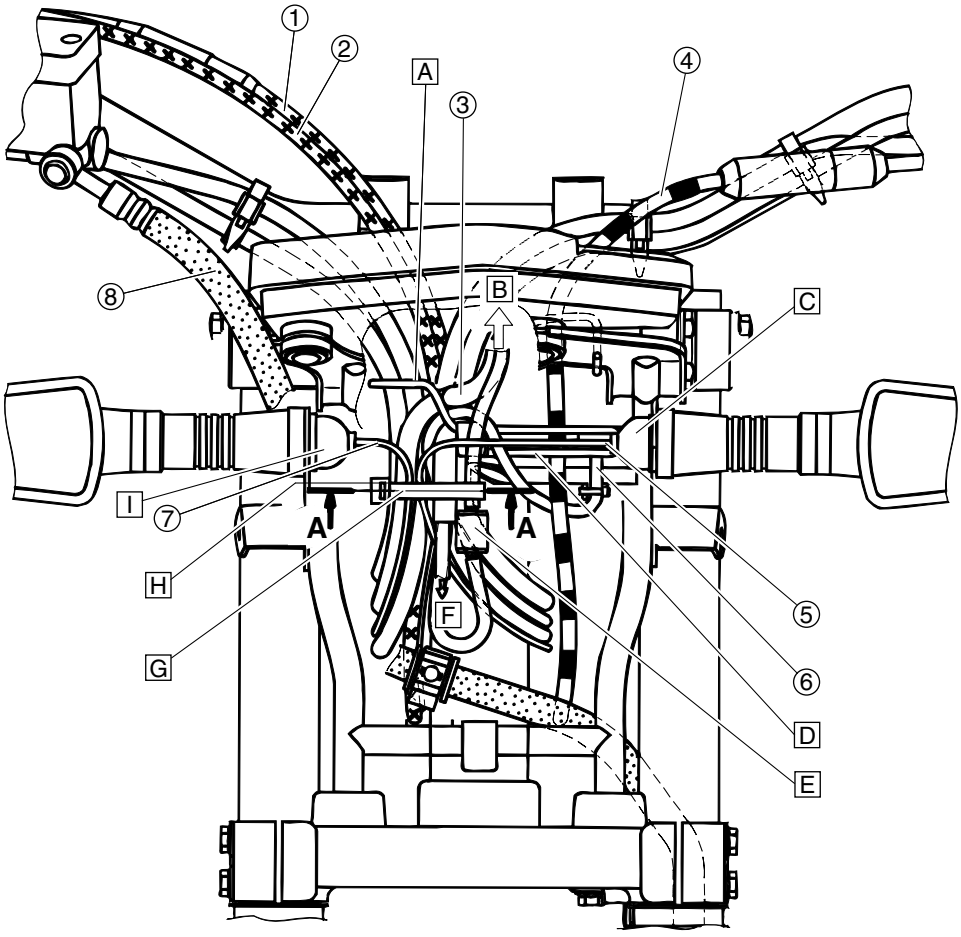
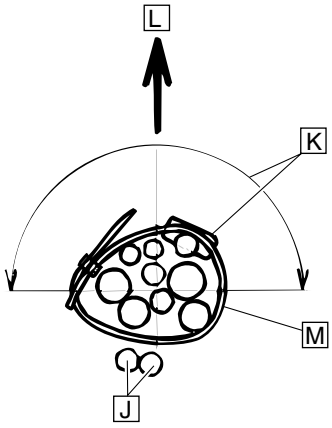
1. Clutch cable
2. Front brake hose
3. Front brake light switch lead
4. Right handlebar switch lead
5. Throttle cable (decelerator cable)
6. Throttle cable (accelerator cable)
7. Carburetor warmer lead
8. Starter motor lead
9. Rear brake light switch lead
10. Negative battery lead
11. Tail/brake light lead/
12. Rear turn signal light leads
13. Thermo switch
14. Rectifier/regulator lead
15. Clutch switch lead
16. Left handlebar switch lead
17. Rectifier/regulator

A. Enter two wire harnesses from the opening of frame cross tube, pass them through the inside of the vehicle, and secure them using plastic locking tie. Face the cable tie end backwards away from the frame cross tube, and cut off the excess end of the tie.
B. Less than 2 mm (0.08 in)
C. Clamp rear turn signal light leads (left and right) and tail/brake light leads using plastic locking tie. Face the cable tie end outwards and cut off the excess end of the tie.
D. Install each lead under the frame without slack.
E. Secure the rear turn signal light leads (left and right) and tail/brake light leads with clamp. Face the clamp opening upwards.
F. Secure the rear left turn signal light lead to the end of rear fender bracket (soldered to the frame) using plastic locking ties. Face the cable tie end backward, and cut off the excess end of the tie if longer than 3 mm (0.12 in).
G. Install the left rear turn signal light lead under the frame without slack.
H. Secure the thermo switch lead, rectifier/regulator lead, and rectifier/regulator ground lead using clamps.
I. Secure the wire harness to the T-stud of the frame.
J. Clamp the clutch cable, throttle cable (accelerator cable), and throttle cable (decelerator cable) using plastic locking tie. Face the tied end inward, and cut off the excess end of the tie.
K. Route the clutch cable between the throttle cable (accelerator cable) and the throttle cable (decelerator cable).
L. Install the rectifier/regulator lead in horizontal to the vehicle.
M. Clamp the plastic locking tie onto the bends of handle as shown in the illustration.
N. Face the plastic locking tie end downwards.

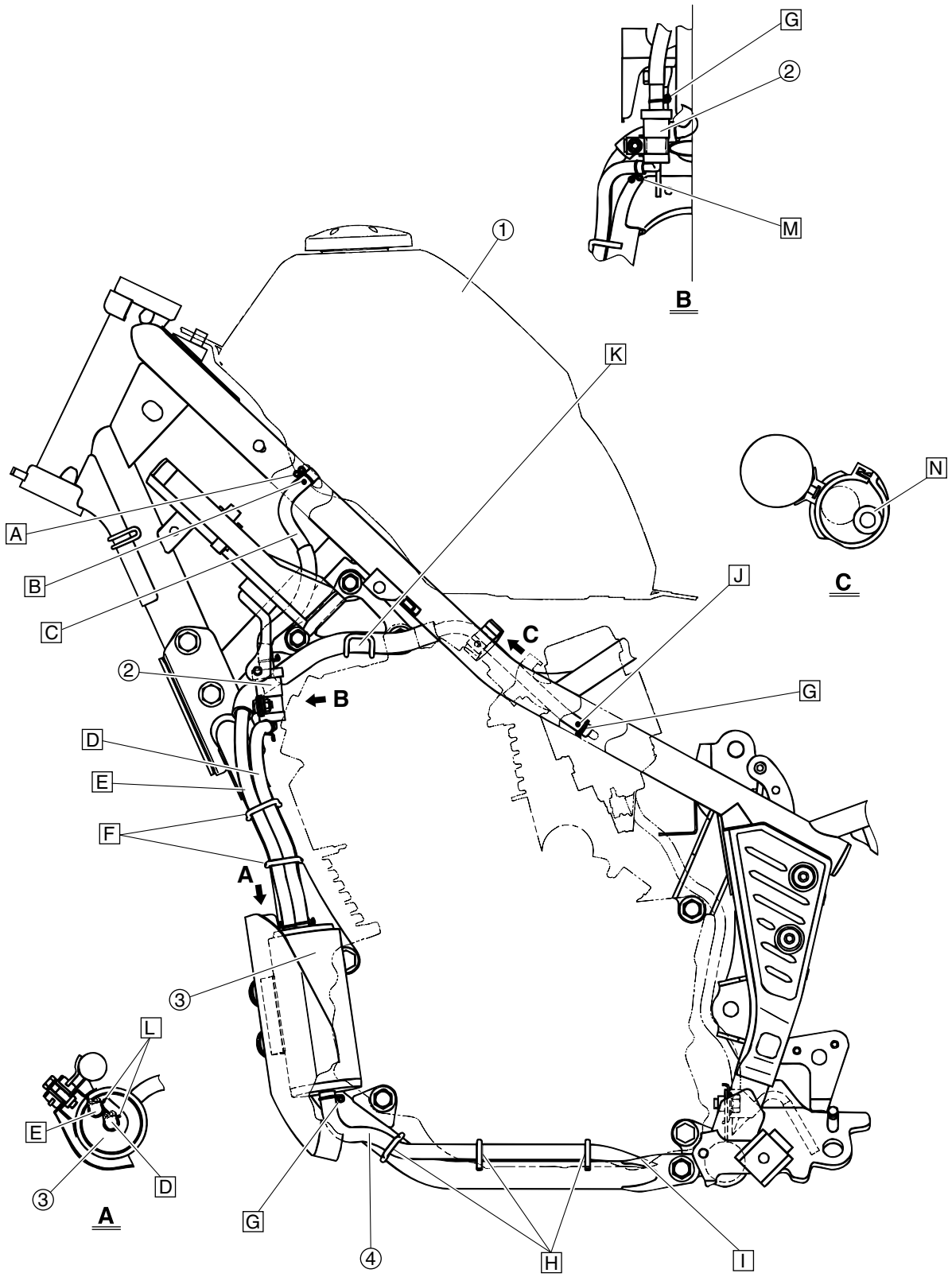




A-A

1. Throttle cable (accelerator cable)
2. Throttle cable (decelerator cable)
3. Meter assembly leads
4. Clutch cable
5. Left front turn signal light lead
6. Main switch lead
7. Right front turn signal light lead
8. Front brake hose

A. Route the meter assembly leads, and main switch leads from the top of the guide to the backward of vehicle.
B. To the meter assembly.
C. Install the left front turn signal light lead to the cap.
D. Route the clutch cable and front left turn signal light lead at the rear of the guide. However, route the main switch leads at the front of the guide.
E. Install the 3-pin coupler for the meter assembly and left handlebar switch as shown in the illustration.
F. To the headlight.
G. Band the meter assembly leads, handlebar switch leads (left and right), front brake light switch lead, front turn signal light leads (left and right), clutch switch lead, and main switch leads with plastic locking tie. The plastic locking tie should position bottom end of the main switch, and face tail forward.
H. Bottom end of the main switch
I. Install the front right turn signal light lead to the cap.
J. Never clamp the throttle cable (accelerator cable) and the throttle cable (decelerator cable) using plastic locking tie.
K. Position the 3-pin coupler for the meter assembly and left handlebar switch at the front of vehicle.
L. Forward of the vehicle.
M. Face the latchet side of the band outward.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1. Fuel tank
2. Roll over valve
3. Canister
4. Canister breather hose

A. Face the end of clip toward the vehicle.
B. Install the hose to fuel tank by facing the white paint mark left side of the vehicle.
C. Pass through the hose in the space of the tool box.
D. Install the hose to the roll over valve and canister.
E. Install the hose to the carburetor and canister.
F. Pass through the hose to the guide.
G. The clip may be installed, which ever direction end of the clip.
H. Pass through the canister breather hose to the guide.
I. Install the end of the canister breather hose to inside of the frame by facing the cut end of the hose downward.
J. Install the hose to the carburetor by facing the white paint mark left side of the vehicle.
K. Pass through the hose onto the guide.
L. Face the end of clip right side of the vehicle.
M. Face the end of clip downward of the vehicle.
N. Fasten the hose and cylinder head breather hose by using the clamp.

PERIODIC CHECKS AND ADJUSTMENTS

EAS20450
PERIODIC MAINTENANCE

EAS20460
INTRODUCTION
This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

NOTE:

If you do not have the tools or experience required for a particular job, have a Yamaha dealer perform it for you.

EWA10340

WARNING

Modifications not approved by Yamaha may cause loss of performance, excessive emissions, and render the vehicle unsafe for use. Consult a Yamaha dealer before attempting any changes.

EAS17580
Periodic maintenance chart for the emission control system

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months
1	*	**Fuel hose**	● Check fuel hoses for cracks or damage. ● Replace if necessary.		√	√	√	√	√
2		**Spark plug**	● Check condition. ● Adjust gap and clean. ● Replace at 7000 mi (11000 km) or 12 months and thereafter every 6000 mi (10000 km) or 12 months.		√	Replace.	√	Replace.	√
3		**Spark arrester**	● Clean.		√	√	√	√	√
4	*	**Valve clearance**	● Check and adjust valve clearance when engine is cold.	√	√	√	√	√	√
5	*	**Crankcase breather system**	● Check breather hose for cracks or damage. ● Replace if necessary.		√	√	√	√	√
6	*	**Idle speed**	● Check and adjust engine idle speed.		√	√	√	√	√
7	*	**Exhaust system**	● Check for leakage. ● Tighten if necessary. ● Replace gasket(s) if necessary.		√	√	√	√	√
8	*	**Evaporative emission control system (For California only)**	● Check control system for damage. ● Replace if necessary.			√		√	

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months
9	*	**Air induction system**	● Check the air cut-off valve, reed valve, and hose for damage. ● Replace any damaged parts.			√		√	

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

EAS32164

General maintenance and lubrication chart

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months
1	*	**Air filter element**	● Check condition and for damage. ● Replace if necessary.		√	√	√	Replace.	√
			● Replace.	Replace at 13000 mi (21000 km) and there after every 12000 mi (20000 km).					
2	*	**Clutch**	● Check operation. ● Adjust or replace cable.	√	√	√	√	√	√
3	*	**Front brake**	● Check operation, fluid level, and for fluid leakage. ● Replace brake pads if necessary.	√	√	√	√	√	√
4	*	**Rear brake**	● Check operation, fluid level, and for fluid leakage. ● Replace brake pads if necessary.	√	√	√	√	√	√
5	*	**Brake hose**	● Check for cracks or damage.		√	√	√	√	√
			● Replace.	Every 4 years					
6	*	**Wheels**	● Check runout, spoke tightness and for damage. ● Tighten spokes if necessary.		√	√	√	√	√
7	*	**Tires**	● Check tread depth and for damage. ● Replace if necessary. ● Check air pressure. ● Correct if necessary.		√	√	√	√	√
8	*	**Wheel bearings**	● Check bearings for smooth operation. ● Replace if necessary.		√	√	√	√	√
9	*	**Swingarm pivot bushes**	● Check bush assemblies for looseness. ● Lubricate with lithium-soap-based grease.		√	√	√	√	√

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months
10		**Drive chain**	● Check chain slack, alignment and condition. ● Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 300 mi (500 km) and after washing the motorcycle or riding in the rain					
11	*	**Steering bearings**	● Check bearing assemblies for looseness. ● Moderately repack with lithium-soap-based grease.	√	√	√	√	Repack.	√
12	*	**Chassis fasteners**	● Check all chassis fitting and fasteners. ● Correct if necessary.		√	√	√	√	√
13		**Brake lever pivot shaft**	● Apply silicone grease lightly.		√	√	√	√	√
14		**Brake pedal pivot shaft**	● Apply lithium-soap-based grease lightly.		√	√	√	√	√
15		**Clutch lever pivot shaft**	● Apply lithium-soap-based grease lightly.		√	√	√	√	√
16		**Shift pedal pivot shaft**	● Apply lithium-soap-based grease lightly.		√	√	√	√	√
17		**Sidestand pivot**	● Check operation. ● Apply lithium-soap-based grease lightly.		√	√	√	√	√
18	*	**Sidestand switch**	● Check operation and replace if necessary.	√	√	√	√	√	√
19	*	**Front fork**	● Check operation and for oil leakage. ● Replace if necessary.		√	√	√	√	√
20	*	**Shock absorber assembly**	● Check operation and for oil leakage. ● Replace if necessary.		√	√	√	√	√
21	*	**Rear suspension link pivots**	● Check operation. ● Correct if necessary.			√		√	
22		**Engine oil**	● Change (warm engine before draining).	√	√	√	√	√	√
23		**Engine oil filter element**	● Replace.	√		√		√	
24	*	**Front and rear brake switches**	● Check operation.	√	√	√	√	√	√
25	*	**Control cables**	● Apply Yamaha chain and cable lube or engine oil SAE 10W-30 thoroughly.	√	√	√	√	√	√
26	*	**Throttle grip housing and cable**	● Check operation and free play. ● Adjust the throttle cable free play if necessary. ● Lubricate the throttle grip housing and cable.		√	√	√	√	√

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months
27	*	**Lights, signals and switches**	● Check operation. ● Adjust headlight beam.	√	√	√	√	√	√

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

NOTE:

From 19000 mi (31000 km) or 36 months, repeat the maintenance intervals starting from 7000 mi (11000 km) or 12 months.

NOTE:

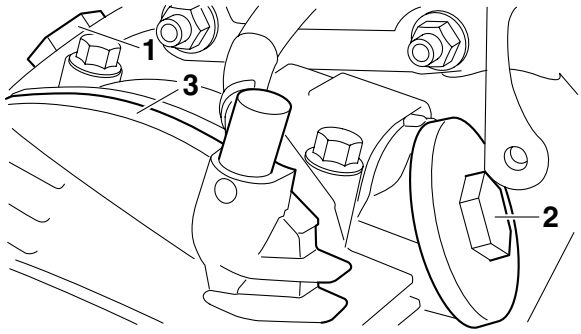
- Air filter
  - This model's air filter is equipped with a disposable oil-coated paper element, which must not be cleaned with compressed air to avoid damaging it.
  - The air filter element needs to be replaced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
  - After disassembling the brake master cylinders and calipers, always change the fluid. Regularly check the brake fluid levels and fill the reservoirs as required.
  - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.

EAS20471
ENGINE

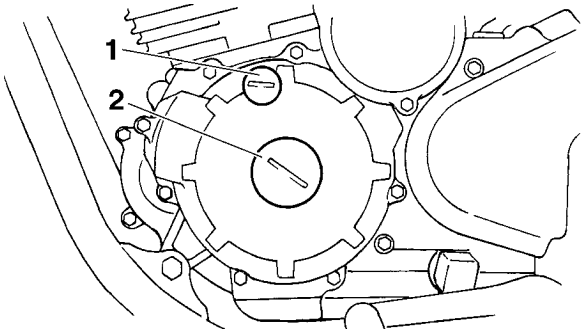
EAS20520
ADJUSTING THE VALVE CLEARANCE
The following procedure applies to all of the valves.

NOTE:
- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

1. Remove:
   - Fuel tank
   Refer to "FUEL TANK" on page 6-1.
2. Remove:
   - Intake tappet cover "1"
   - Exhaust tappet cover "2"
   - Camshaft sprocket cover "3"



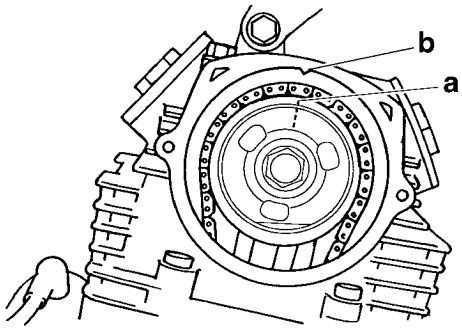
3. Remove:
   - Spark plug cap
   - Spark plug
4. Remove:
   - Timing mark accessing screw "1"
   - Crankshaft end cover "2"



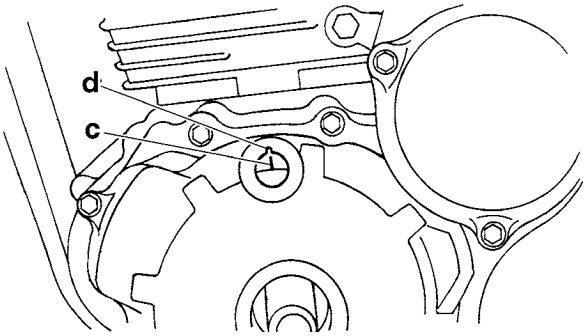
5. Measure:
   - Valve clearance
   Out of specification → Adjust.

Valve clearance (cold)
Intake
0.05–0.10 mm (0.0020–0.0039 in)
Exhaust
0.10–0.15 mm (0.0039–0.0059 in)

a. Turn the crankshaft counterclockwise.
b. When the piston is in the compression stroke, align camshaft sprocket mark "a" with cylinder head mark "b". This is the Top Dead Center (TDC).

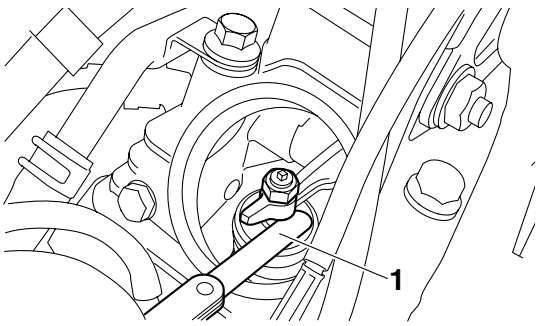


c. Make sure that generator rotor mark "c" aligns with generator rotor cover mark "d".



d. Measure the valve clearance using special thickness gauge "1".
Out of specification → Adjust.

Special thickness gauge
90890-01399



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6. Adjust:
   • Valve clearance

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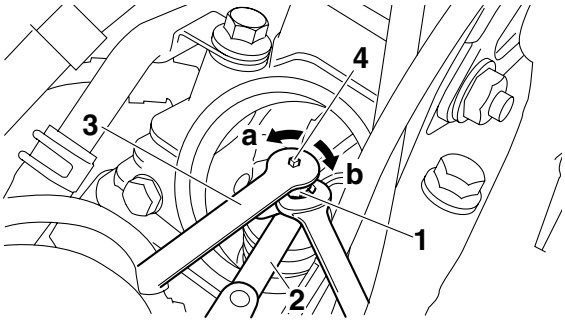
a. Loosen the locknut "1"
b. Insert special thickness gauge "2" between the adjusting screw and the valve stem end.
c. Using tappet adjusting tool "3", turn the adjusting screw "4" in direction "a" or "b" to adjust the valve clearance.



Direction "a"
Increases the valve clearance.
Direction "b"
Decreases the valve clearance.

Tappet adjusting tool
90890-01311
Six piece tappet set
YM-A5970

• Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.

Lock nut (valve clearance adjusting screw)
14 Nm (1.4 m•kg, 10 ft•lb)

d. Measure the valve clearance again.
e. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

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7. Install:
   • O-ring New
   • Crankshaft end cover
   • O-ring New
   • Timing mark accessing screw

8. Install:
   • Spark plug
   • Spark plug cap

Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

9. Install:
   • O-ring New
   • Camshaft sprocket cover
   • O-ring New
   • Exhaust tappet cover
   • O-ring New
   • Intake tappet cover

Camshaft sprocket cover bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)
Exhaust tappet cover
18 Nm (1.8 m•kg, 13 ft•lb)
Intake tappet cover
18 Nm (1.8 m•kg, 13 ft•lb)

10. Install:
    • Fuel tank
    Refer to "FUEL TANK" on page 6-1.

EAS20610

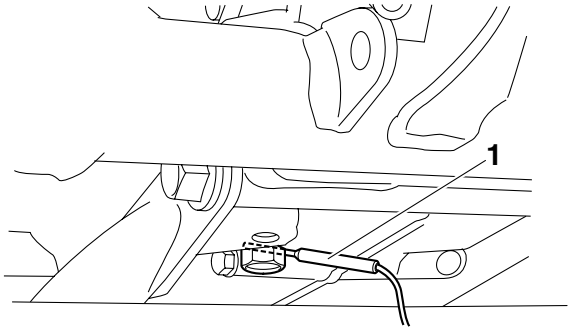
ADJUSTING THE ENGINE IDLING SPEED

NOTE:

Before adjusting the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

1. Install:
   • Pocket tester (temperature probe) "1"
   (To oil drain bolt)
   • Digital tachometer

Pocket tester
90890-03132
Digital tachometer
90890-06760
YU-39951-B



2. Start the engine and let it warm up until it reaches specified oil temperature.

Oil temperature
95.0–105.0 °C (203.00–221.00 °F)

3. Check:
   - Engine idling speed
   Out of specification → Adjust.

Engine idling speed
1300–1500 r/min

4. Adjust:
   - Engine idling speed

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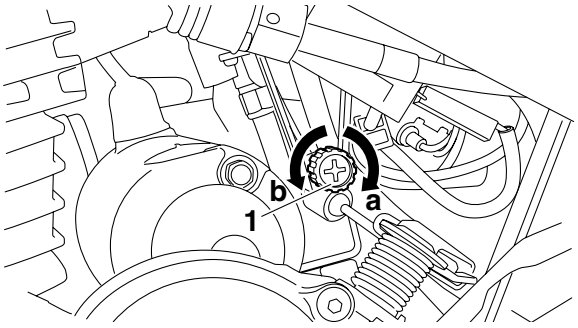
a. Adjust the engine idling speed by turning the throttle stop screw "1" in direction "a" or "b".

Direction "a"
Increases the engine idling speed.
Direction "b"
Decreases the engine idling speed.



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5. Adjust:
   - Throttle cable play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-9.

Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

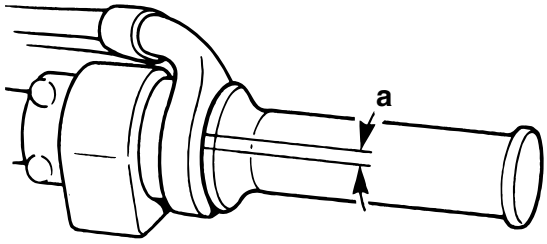
EAS20640

ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE:

Before adjusting the throttle cable free play, the engine idling speed should be adjusted properly.

1. Check:
   - Throttle cable play "a"
   Out of specification → Adjust.



Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

2. Adjust:
   - Throttle cable free play

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Carburetor side

a. Loosen locknut "1" of the pulling (accelerating) throttle cable.
b. Adjust dimension "a" to approximately 5 mm by turning the adjusting nut "2" as shown.
c. Tighten the locknut "1".

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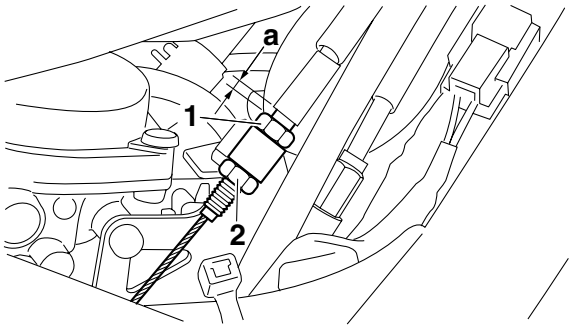

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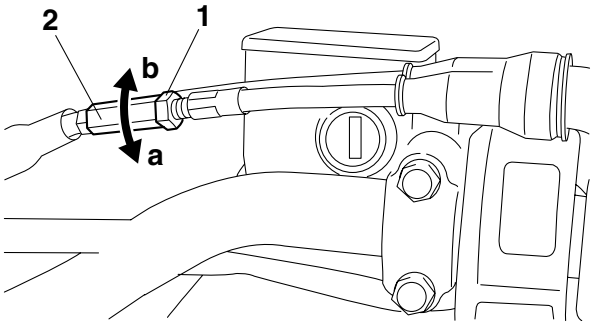
Handlebar side

a. Loosen the locknut “1”.
b. Adjust the play of throttle cable by turning the adjusting nut “2” in direction “a” or “b”.

Direction “a”
Increases the throttle cable play.
Direction “b”
Decreases the throttle cable play.

c. Tighten the locknut.



EWA12920

⚠ WARNING

After adjusting the throttle cable free play, start the engine and turn the handlebars to the right and to the left to ensure that this does not cause the engine idling speed to change.

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EAS20690

CHECKING THE SPARK PLUG

1. Disconnect:
   - Spark plug cap
2. Remove:
   - Spark plug

ECA13330

CAUTION:

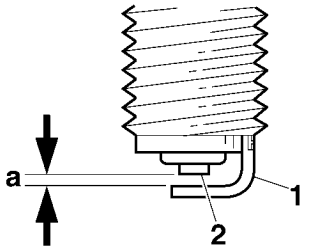
Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

3. Check:
   - Spark plug type
     Incorrect → Change.

Manufacturer/model
NGK/DR7EA

4. Check:
   - Electrode “1”
     Damage/wear → Replace the spark plug.
   - Insulator “2”
     Abnormal color → Replace the spark plug.
     Normal color is medium-to-light tan.
5. Clean:
   - Spark plug
     (with a spark plug cleaner or wire brush)
6. Measure:
   - Spark plug gap “a”
     (with a wire thickness gauge)
     Out of specification → Regap.

Spark plug gap
0.6–0.7 mm (0.024–0.028 in)



7. Install:
   - Spark plug

Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

NOTE:

Before installing the spark plug, clean the spark plug and gasket surface.

8. Connect:
   - Spark plug cap

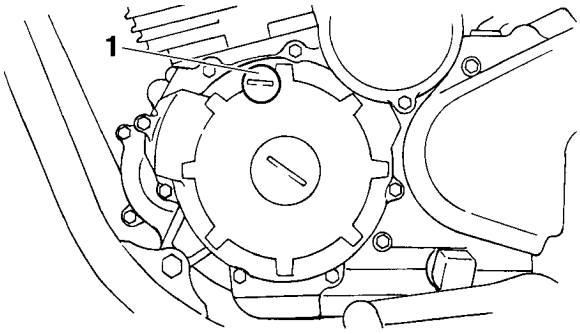
EAS20700

CHECKING THE IGNITION TIMING

NOTE:

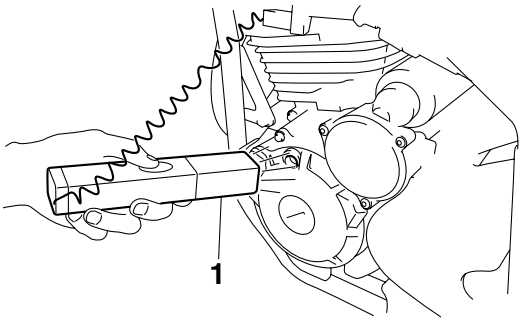
Before checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

1. Remove:
   - Timing mark accessing screw “1”



2. Connect:
   - Timing light “1”
   - Digital tachometer

Timing light
90890-03141
Inductive clamp timing light
YU-03141
Digital tachometer
90890-06760
YU-39951-B



3. Check:
   - Ignition timing

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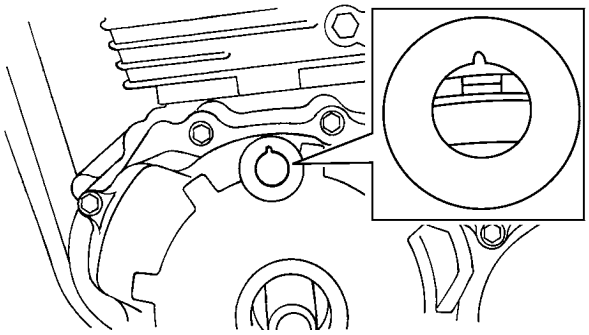
a. Start the engine, warm it up to the specified oil temperature, then adjust to the standard idling speed.

Engine idling speed
1300–1500 r/min

b. Check the firing range as shown.
   Out of the firing range → Check the ignition system



NOTE:
The ignition timing is not adjustable.

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4. Remove:
   - Digital tachometer
   - Timing light
5. Install:
   - Timing mark accessing screw

EAS20710
MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

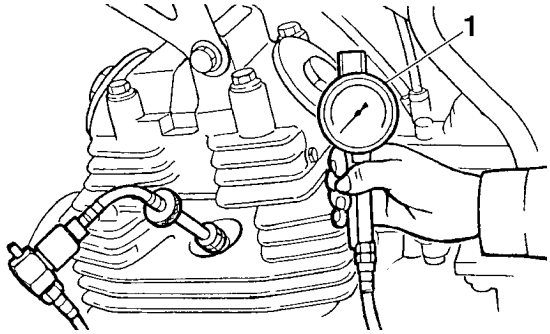
NOTE:
Insufficient compression pressure will result in a loss of performance.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Disconnect:
   - Spark plug cap
4. Remove:
   - Spark plug

ECA13340
CAUTION:
Before removing the spark plugs, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinders.

5. Install:
   - Compression gauge “1”

Compression gauge
90890-03081
Engine compression tester
YU-33223



6. Measure:
   • Compression pressure
   Out of specification → Refer to steps (c) and (d).

Standard compression pressure
1200 kPa (12.0 kg/cm²/300 rpm)
Minimum compression pressure
1050 kPa (10.5 kg/cm²/300 rpm)
Maximum compression pressure
1300 kPa (13.0 kg/cm²/300 rpm)

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a. Set the main switch to "ON".
b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

EWA12960

⚠ WARNING

To prevent sparking, ground the spark plug lead before cranking the engine.

NOTE:

- Make use the battery is fully charged when taking measurements.
- Make sure there is no compression leakage from the connecting section of the compression gauge.

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces and piston crown for carbon deposits.
   Carbon deposits → Eliminate.
d. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.
   Refer to the following table.

Compression pressure (with oil applied into the cylinder)	
Reading	Diagnosis
Higher than without oil	Piston ring(s) wear or damage → Repair.
Same as without oil	Piston, valves, cylinder head gasket or piston possibly defective → Repair.

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7. Install:
   • Spark plug

Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

8. Connect:
   • Spark plug cap

EAS20730

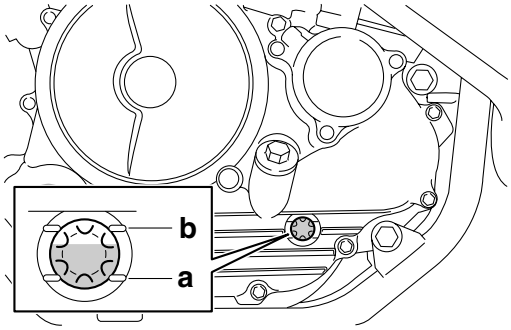
CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

NOTE:

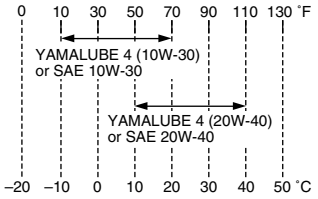
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

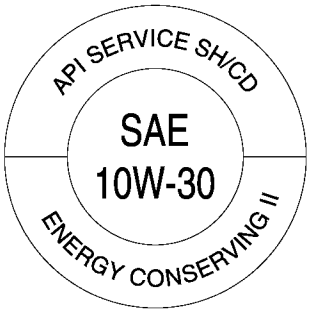
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Check:
   • Engine oil level
   The engine oil level should be between the minimum level mark "a" and maximum level mark "b".
   Below the minimum level mark → Add the recommended engine oil to the proper level.



Type
YAMALUBE 4, SAE10W30 or SAE20W40
Recommended engine oil grade
API service SG type or higher, JASO standard MA
ACEA standard
G4 or G5

ECA13360
CAUTION:
- **Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of CD or higher and do not use oils labeled "ENERGY CONSERVING II".**
- **Do not allow foreign materials to enter the crankcase.**





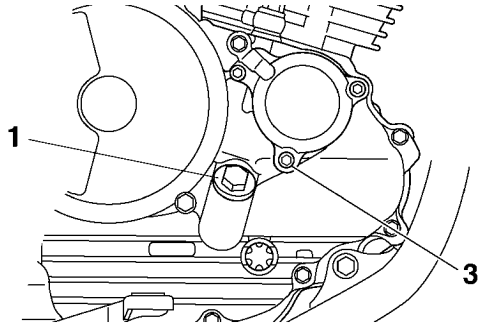
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

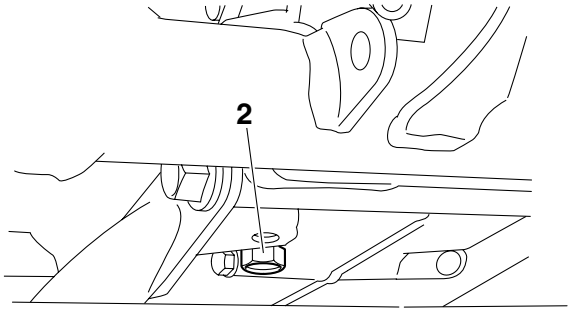
4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

EAS20810
CHANGING THE ENGINE OIL

1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
   - Engine oil filler cap "1"
   - Engine oil drain bolt "2" (along with the gasket)
   - Oil filter element drain bolt "3"





4. Drain:
   - Engine oil (completely from the crankcase)
5. If the oil filter element is also to be replaced, perform the following procedure.

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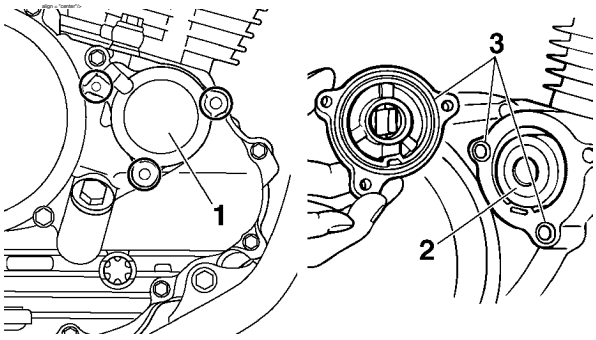
a. Remove the oil filter element cover "1" and oil filter element "2".
b. Replace the O-rings "3". New



c. Install the new oil filter element and the oil filter element cover.

	Oil filter element cover bolt (M10) 10 Nm (1.0 m•kg, 7.2 ft•lb)

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6. Check:
   - Engine oil drain bolt gasket
   - Oil filter element drain bolt gasket

   Damage → Replace.
7. Install:
   - Engine oil drain bolt
   - Oil filter element drain bolt

   (along with the gasket)

Engine oil drain bolt
20 Nm (2.0 m•kg, 15 ft•lb)
Oil filter element drain bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

8. Fill:
   - Crankcase

   (with the specified amount of the recommended engine oil)

Engine oil quantity
Total amount
1.40 L (1.48 US qt) (1.23 Imp.qt)
Without oil filter element replacement
1.20 L (1.27 US qt) (1.06 Imp.qt)
With oil filter element replacement
1.30 L (1.37 US qt) (1.14 Imp.qt)

9. Install:
   - Engine oil filler cap
10. Start the engine, warm it up for several minutes, and then turn it off.
11. Check:
    - Engine

    (for engine oil leaks)
12. Check:
    - Engine oil level

    Refer to "CHECKING THE ENGINE OIL LEVEL" on page 3-12.
13. Check:
    - Engine oil pressure

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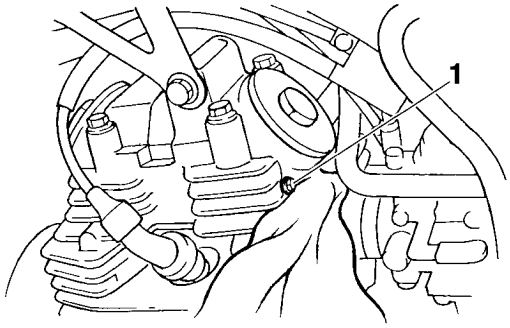
a. Slightly loosen the oil check bolt "1".



b. Start the engine and keep it idling until engine oil starts to seep from the oil check bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
c. Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to "INSTALL THE OIL PUMP AND BALANCER GEAR" on page 5-41.
d. Start the engine after solving the problem(s) and check the engine oil pressure again.
e. Tighten the oil check bolt to specification.

Oil check bolt
7 Nm (0.7 m•kg, 5.1 ft•lb)

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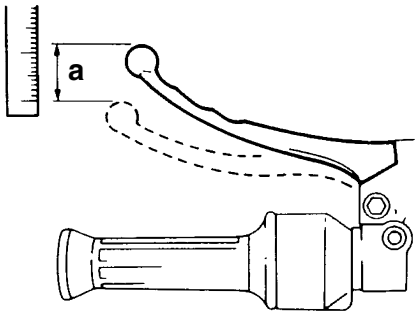
EAS20870

ADJUSTING THE CLUTCH CABLE FREE PLAY

1. Check:
   - Clutch cable free play "a"

   Out of specification → Adjust.

Clutch cable free play
10.0–15.0 mm (0.39–0.59 in)



2. Adjust:
   - Clutch cable free play

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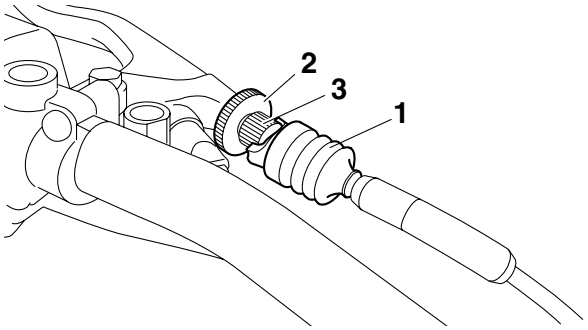
Clutch lever side

a. Slide rubber cover “1” from the clutch lever.
b. Loosen the locknut “2”.
c. Fully tighten the adjusting bolt “3”.
d. Tighten the locknut “2”.
e. Slide and return rubber cover “1” to original position.



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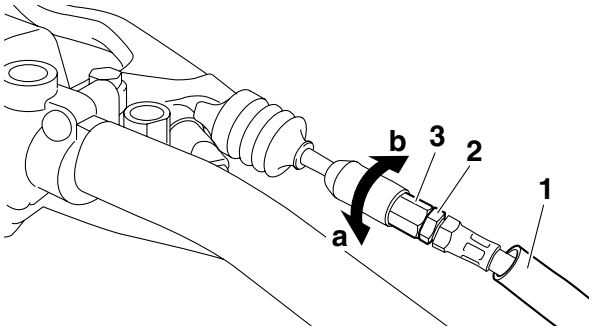
Clutch cable side

a. Slide rubber cover “1” from the clutch lever.
b. Loosen the locknut “2”.
c. Adjust the play of clutch cable by turning the adjusting bolt “3” in direction “a” or “b”.

Direction “a”
Increases the clutch cable play.
Direction “b”
Decreases the clutch cable play.

d. Tighten the locknut “2”.
e. Slide and return rubber cover “1” to original position.



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EAS20961

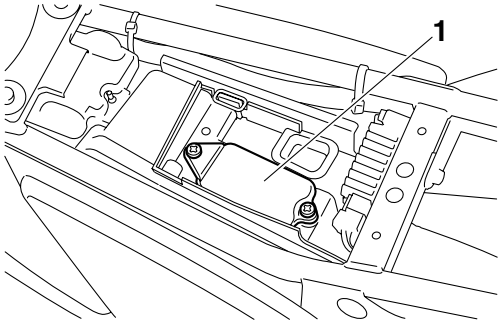
REPLACING THE AIR FILTER ELEMENT

1. Check:
   • Air filter check hose

NOTE:

Check the air filter check hose locating at the bottom of air filter case. If a foreign material such as dust and water is found, replace the air filter element. Also, clean the air filter case and air filter check hose.

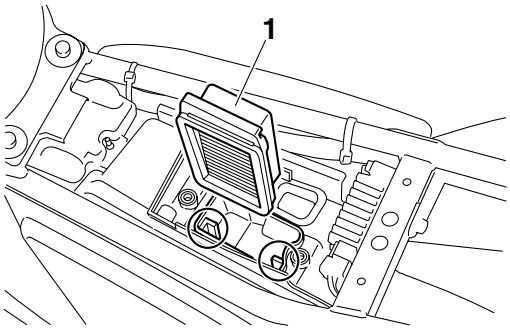
2. Remove:
   • Seat
   Refer to “GENERAL CHASSIS” on page 4-1.
3. Remove:
   • Air filter case cap “1”



4. Check:
   • Air filter element “1”
   Damage/obstruction → Replace.

NOTE:

- Replace the air filter element every 20.000 km (12,427.42 mi) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.



5. Install:
   • Air filter element
   • Air filter case cap

ECA14401

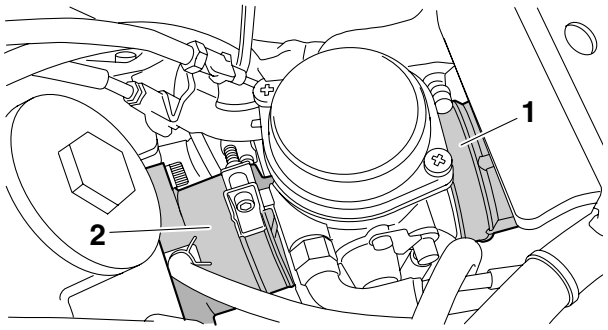
CAUTION:

Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect carburetor synchronization, leading to poor engine performance and possible overheating.

NOTE:
Make sure that the air filter element is installed securely in the air filter case to prevent any air leaks.

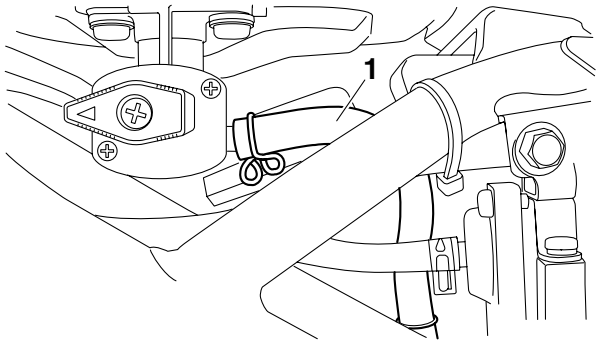
6. Install:
   - Seat
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS20990
CHECKING THE CARBURETOR JOINT AND INTAKE MANIFOLD
1. Remove:
   - Fuel tank
   Refer to "FUEL TANK" on page 6-1.
2. Check:
   - Carburetor joint "1"
   - Intake manifold "2"
   Cracks/damage → Replace.
   Refer to "CARBURETOR" on page 6-3.



3. Install:
   - Fuel tank
   Refer to "FUEL TANK" on page 6-1.

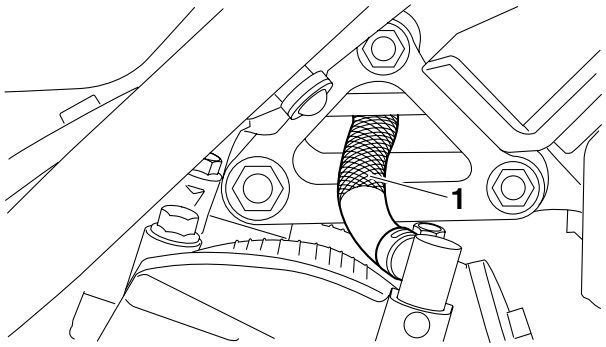
EAS21030
CHECKING THE FUEL LINE
The following procedure applies to all of the fuel, vacuum and breather hoses.
1. Remove:
   - Left fuel tank side cover
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
   - Fuel hose "1"
   - Vacuum hose
   - Breather hose
   Cracks/damage → Replace.
   Loose connection → Connect properly or replace the clip hose.



3. Install:
   - Left fuel tank side cover
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS21050
CHECKING THE CYLINDER HEAD BREATHER HOSE
1. Remove:
   - Left fuel tank side cover
   - Right fuel tank side cover
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
   - Cylinder head breather hose "1"
   Cracks/damage → Replace.
   Loose connection → Connect properly.

ECA14920
CAUTION:
Make sure the cylinder head breather hose is routed correctly.



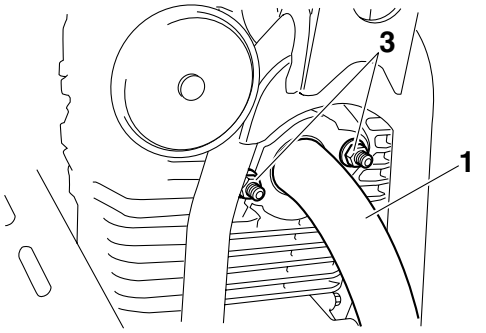
3. Install:
   - Right fuel tank side cover
   - Left fuel tank side cover
   Refer to "GENERAL CHASSIS" on page 4-1.

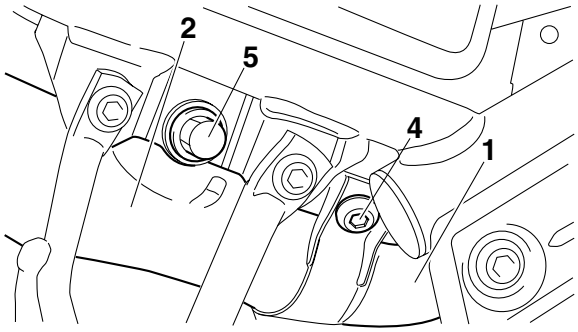
EAS21080
CHECKING THE EXHAUST SYSTEM
The following procedure applies to all of the exhaust pipes and gaskets.
1. Check:
   - Exhaust pipe "1"
   - Muffler "2"
   Cracks/damage → Replace.
   - Gasket

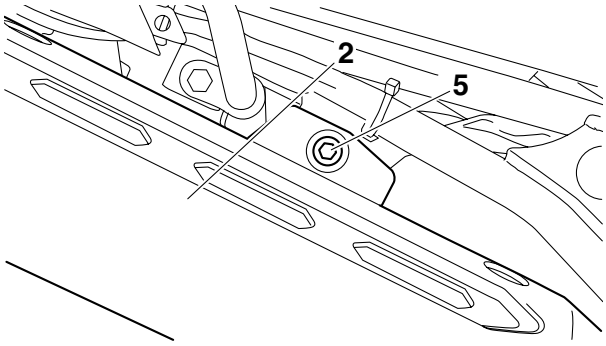
Exhaust gas leaks → Replace.

2. Check:
   Tightening torque
   - Exhaust pipe nut “3”
   - Exhaust pipe joint bolt “4”
   - Muffler bolt “5”

Exhaust pipe nut
18 Nm (1.8 m•kg, 13 ft•lb)
Exhaust pipe joint bolt
20 Nm (2.0 m•kg, 15 ft•lb)
Muffler bolt
42 Nm (4.2 m•kg, 30 ft•lb)



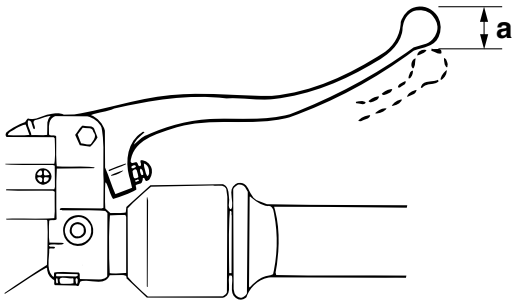




EAS21140
CHASSIS

EAS21170
ADJUSTING THE FRONT DISC BRAKE

1. Check:
   - Brake lever free play “a”
     Out of specification → Adjust.



Brake lever free play
2.0–5.0 mm (0.08–0.20 in)

2. Adjust:
   - Brake lever free play

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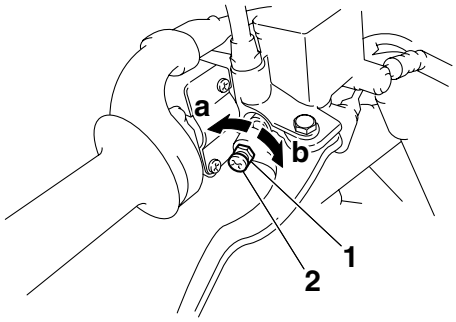
a. Loosen the locknut “1”.
b. Turn the adjusting screw “2” in direction “a” or “b” until the specified brake lever free play is obtained.

Direction “a”
Brake lever free play is increased.
Direction “b”
Brake lever free play is decreased.

c. Tighten the locknut “1”.



EWA13050
WARNING

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance.

ECA13490
CAUTION:

After adjusting the brake lever position, make sure there is no brake drag.

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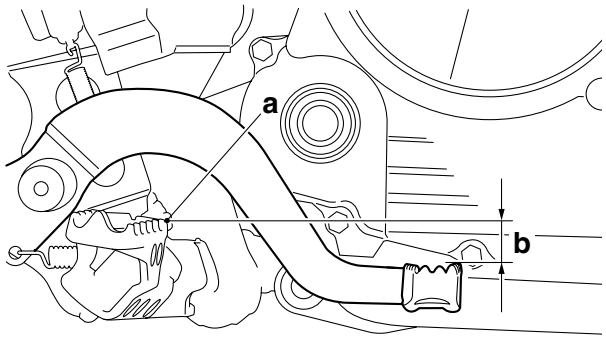
EAS21200
ADJUSTING THE REAR DISC BRAKE

1. Check:
   - Brake pedal position
     (Height “b” from footrest position “a” to brake pedal top position)
     Out of specification → Adjust.

Brake pedal position
20.0 mm (0.79 in)



2. Adjust:
   - Brake pedal position

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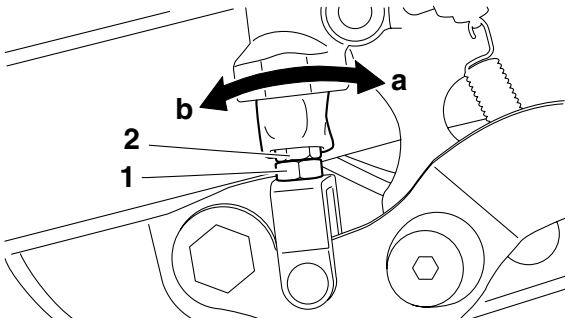
a. Loosen the locknut “1”.
b. Turn the adjusting nut “2” in direction “a” or “b” until the specified brake pedal position is obtained.

Direction “a”
Brake pedal is raised.
Direction “b”
Brake pedal is lowered.



c. Tighten the locknut "1" to specification.

	Locknut **17 Nm (1.7 m•kg, 12.5 ft•lb)**

EWA5UXB005

⚠ WARNING

A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.

ECA13510

CAUTION:

After adjusting the brake pedal position, make sure there is no brake drag.

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3. Adjust:
   - Rear brake light switch
     Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-20.

EAS21240

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

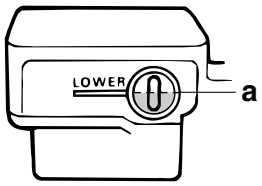
NOTE:

- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

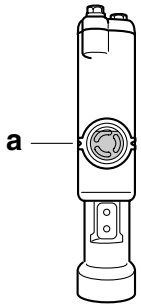
2. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.

	Recommended fluid **DOT 4**

A



B



A. Front
B. Rear

EWA13090

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

NOTE:

In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

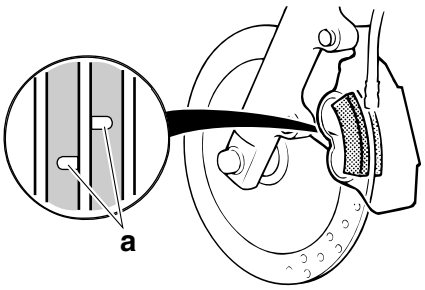
EAS21250

CHECKING THE FRONT BRAKE PADS

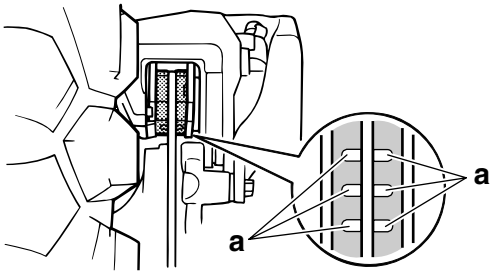
The following procedure applies to all of the brake pads.

1. Operate the brake.

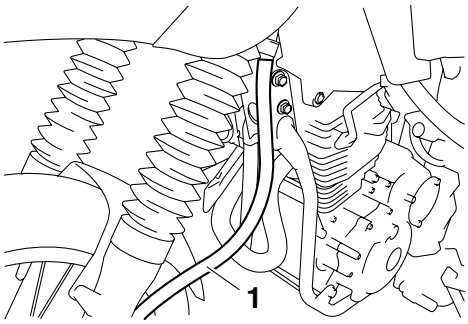
2. Check:
   • Front brake pad
   Wear indicator grooves “a” almost disappeared → Replace the brake pads as a set.
   Refer to “FRONT BRAKE” on page 4-12.



EAS21260
CHECKING THE REAR BRAKE PADS
The following procedure applies to all of the brake pads.
1. Operate the brake.
2. Check:
   • Rear brake pad
   Wear indicator grooves “a” almost disappeared → Replace the brake pads as a set.
   Refer to “REAR BRAKE” on page 4-24.

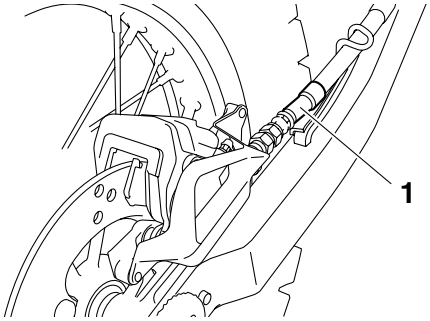


EAS21270
CHECKING THE FRONT BRAKE HOSE
1. Check:
   • Front brake hose “1”
   Cracks/damage/wear → Replace.



2. Check:
   • Brake hose clamp
   Loose connection → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the front brake several times.
4. Check:
   • Front brake hose
   Brake fluid leakage → Replace the damaged hose.
   Refer to “FRONT BRAKE” on page 4-12.

EAS21290
CHECKING THE REAR BRAKE HOSE
1. Check:
   • Front brake hose “1”
   Cracks/damage/wear → Replace.



2. Check:
   • Brake hose clamp
   Loose connection → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the rear brake several times.
4. Check:
   • Rear brake hose
   Brake fluid leakage → Replace the damaged hose.
   Refer to “REAR BRAKE” on page 4-24.

EAS21330
ADJUSTING THE REAR BRAKE LIGHT SWITCH
NOTE:
The rear brake light switch is operated by movement of the brake pedal. The rear brake light is properly adjusted when the brake light comes on just before the braking effect starts.

1. Check:
   • Brake light operation timing
   Incorrect → Adjust.
2. Adjust:
   • Brake light operation timing

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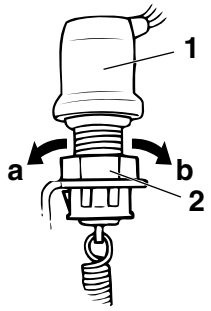
a. Hold the main body “1” of the rear brake light switch so that it does not rotate and turn the adjusting nut “2” in direction “a” or “b” until the rear brake light comes on at the proper time.

Direction “a”
Brake light comes on sooner.
Direction “b”
Brake light comes on later.



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EAS21350

BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100

⚠ WARNING

Bleed the hydraulic brake system whenever:
- **the system is disassembled.**
- **a brake hose is loosened, disconnected or replaced.**
- **the brake fluid level is very low.**
- **brake operation is faulty.**

1. Remove:
   - Brake master cylinder reservoir cap

NOTE:
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.

2. Bleed:
   - Hydraulic brake system

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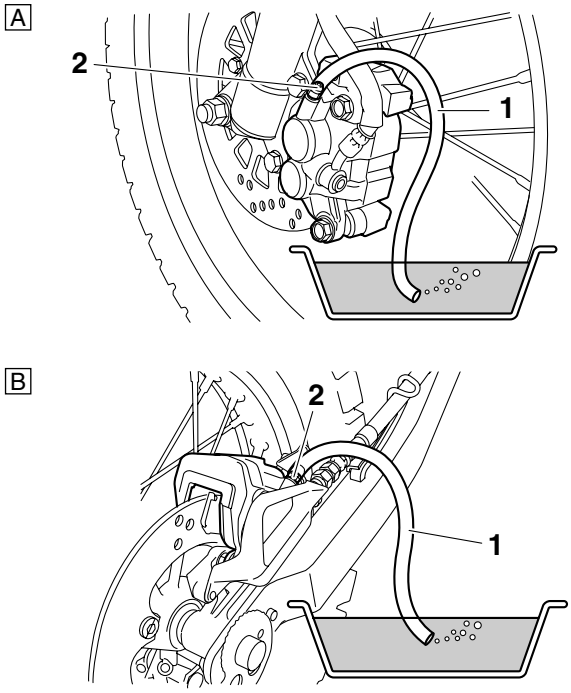
a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Connect clear plastic hose “1” tightly to bleed screw “2”, and place an oil pan under the plastic hose end.



A. Front
B. Rear

d. Place the other end of the hose into a container.
e. Slowly apply the brake several times.
f. Fully pull the brake lever or fully press down the brake pedal and hold it in position.
g. Loosen the bleed screw.

NOTE:
Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip or the brake pedal to fully extend.

h. Tighten the bleed screw and then release the brake lever or brake pedal.
i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
j. Tighten the bleed screw to specification.

	Bleed screw **6 Nm (0.6 m•kg, 4.3 ft•lb)**

k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-19.

EWA13110

⚠ WARNING

After bleeding the hydraulic brake system,

check the brake operation.

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EAS21420
ADJUSTING THE DRIVE CHAIN SLACK

NOTE:
The drive chain slack must be checked at the tightest point on the chain.

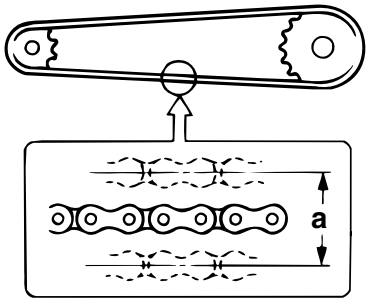
ECA13550
CAUTION:
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING
Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Spin the rear wheel several times and find the tightest position of drive chain.
3. Check:
   - Drive chain slack "a"
     Out of specification → Adjust.



	Drive chain slack **40.0–45.0 mm (1.57–1.77 in)**

NOTE:
- Measure the drive chain slack in the intermediate position between drive axle center and rear wheel axle center.
- If the chain contacts the drive chain guide, this is the limit of chain slack.

4. Adjust:
   - Drive chain slack

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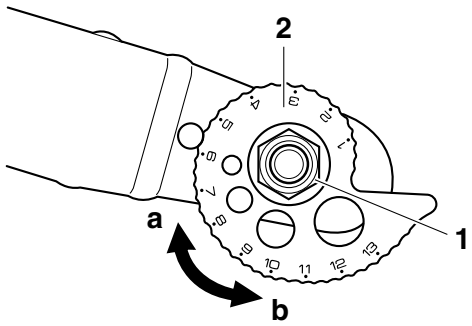
a. Loosen the wheel axle nut "1".
b. Turn the drive chain adjusting plate "2" in direction "a" or "b" until the specified drive chain slack is obtained.

Direction "a"
Drive chain is tightened.
Direction "b"
Drive chain is loosened.



NOTE:
To maintain the proper wheel alignment, adjust both sides evenly.

c. Tighten the wheel axle nut to specification.

	Rear wheel axle nut **85 Nm (8.5 m•kg, 62 ft•lb)**

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EAS21440
LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the vehicle is used in dusty areas.
This vehicle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains. Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.

Recommended lubricant
Engine oil or chain lubricant suitable for O-ring chains

EAS21510
CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the front wheel is elevated.

2. Check:
   - Steering head
     Grasp around the outer tube of the front fork legs and gently rock the front fork.
     Binding/looseness → Adjust the steering head.
3. Remove:
   - Upper bracket
     Refer to "STEERING HEAD" on page 4-47.
4. Adjust:
   - Steering head

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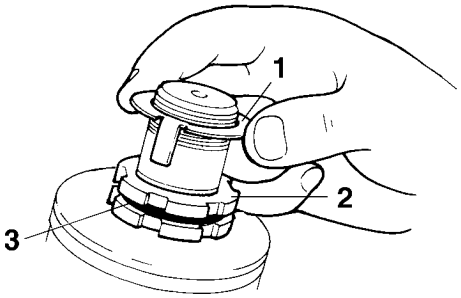
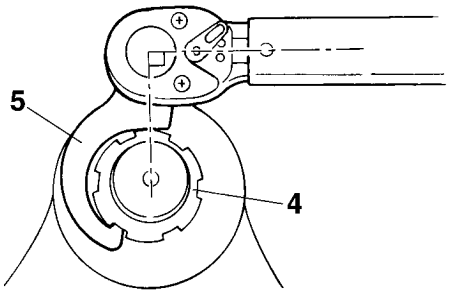
a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".



b. Loosen the lower ring nut "4" first, then use the steering nut wrench "5" and retighten the nut with the specified torque. Next, check the steering by turning it to the right and left a few times.

NOTE:
Set the torque wrench at a right angle to the steering nut wrench.



Steering nut wrench
90890-01403
Spanner wrench
YU-33975

Lower ring nut (initial tightening torque)
38 Nm (3.8 m•kg, 2.8 ft•lb)

c. Loosen the lower ring nut "4" completely, and then use the steering nut wrench and retighten the nut with the specified torque.

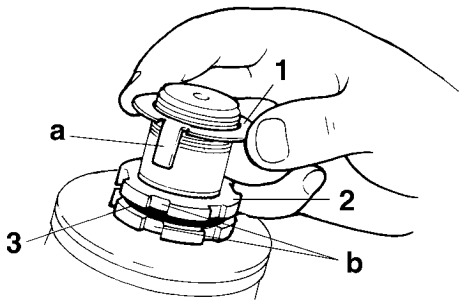
EWA13140
⚠ WARNING

Do not overtighten the lower ring nut.

Lower ring nut (final tightening torque)
4 Nm (0.4 m•kg, 2.9 ft•lb)

d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
   Refer to "STEERING HEAD" on page 4-47.
e. Install the rubber washer "3".
f. Install the upper ring nut "2".
g. Finger tighten the upper ring nut "2", then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.

NOTE:
Make sure the lock washer tabs "a" sit correctly in the ring nut slots "b".



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5. Install:
   - Upper bracket
     Refer to "STEERING HEAD" on page 4-47.

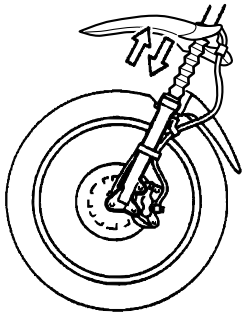
EAS21530
CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

2. Check:
   - Inner tube
     Damage/scratches → Replace.
   - Oil seal
     Oil leakage → Replace.
3. Hold the vehicle upright and apply the front brake.
4. Check:
   - Front fork operation
     Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
     Rough movement → Repair.
     Refer to "FRONT FORK" on page 4-39.



EAS21590
ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

Spring preload

ECA13590
CAUTION:

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
   - Spring preload

NOTE:

Adjust the spring preload by removing the rear shock absorber.

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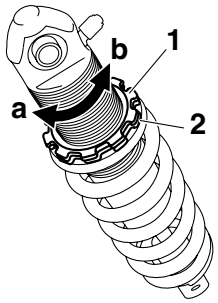
a. Adjust the spring preload with a ring nut wrench.

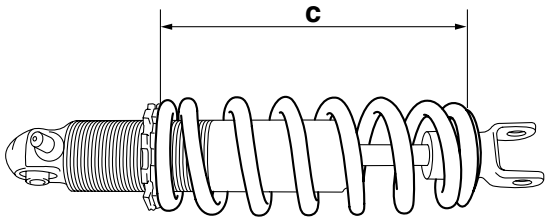
Ring nut wrench
90890-01268
Spanner wrench
YU-01268

b. Loosen the locknut "1".
c. When you turn adjusting ring "2" in direction "a" or "b", spring length "c" changes and you can adjust the spring preload.

Direction "a"
Spring preload is increased (suspension is harder).
Direction "b"
Spring preload is decreased (suspension is softer).



Spring length "c"
Standard
197.0 mm
Minimum (hard)
187.0 mm
Maximum (soft)
207.0 mm



d. Tighten the locknut.

Locknut
10 Nm (1.0 m•kg, 7.2 ft•lb)

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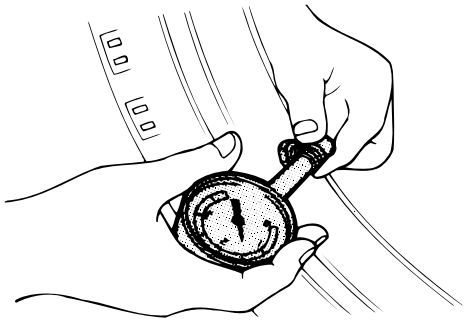
EAS21650
CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   - Tire pressure
     Out of specification → Regulate.



EWA13180
⚠ WARNING

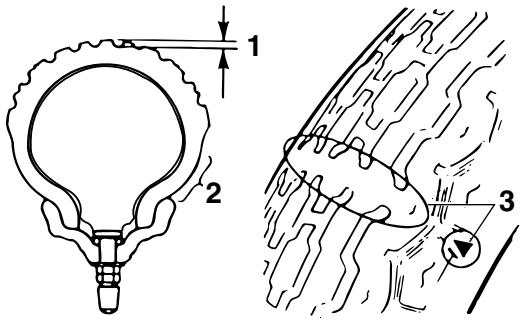
- **The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.**
- **The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.**
- **Operation of an overloaded vehicle could cause tire damage, an accident or an injury. NEVER OVERLOAD THE VEHICLE.**

Tire air pressure (measured on cold tires)
Loading condition
0–90 kg (0–198 lb)
Front
125 kPa (18 psi) (1.25 kgf/cm^2)
Rear
150 kPa (22 psi) (1.50 kgf/cm^2)
Loading condition
90 kg–Maximum load
Front
150 kPa (22 psi) (1.50 kgf/cm^2)
Rear
175 kPa (25 psi) (1.75 kgf/cm^2)
High-speed riding
Front
150 kPa (1.50 kgf/cm^2)
Rear
175 kPa (1.75 kgf/cm^2)
Maximum load
160 kg (353 lb)
*** Total weight of rider, passenger, cargo and accessories**

EWA13190
⚠ WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

2. Check:
   - Tire surfaces
     Damage/wear → Replace the tire.



1. Tire tread depth
2. Side wall
3. Wear indicator

Wear limit (front)
0.8 mm (0.03 in)
Wear limit (rear)
0.8 mm (0.03 in)

EWA14080
WARNING

- **Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.**
- **When using a tube tire, be sure to install the correct tube.**
- **Always replace a new tube tire and a new tube as a set.**
- **To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.**
- **Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.**

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090
WARNING

After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this vehicle.

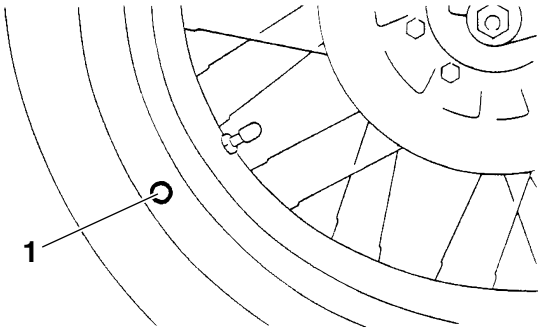
Front tire
Size
2.75-21 45P
Manufacturer/model
CHENG SHIN/C-6006
Manufacturer/model
DUNLOP/D605F

Rear tire
Size
120/80-18M/C 62P
Manufacturer/model
CHENG SHIN/C-6006
Manufacturer/model
DUNLOP/D605

EWA13210
WARNING

New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

NOTE:
Align the mark “1” with the valve installation point.



EAS21670
CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
   - Wheel
     Damage/out-of-round → Replace.

EWA13260
WARNING

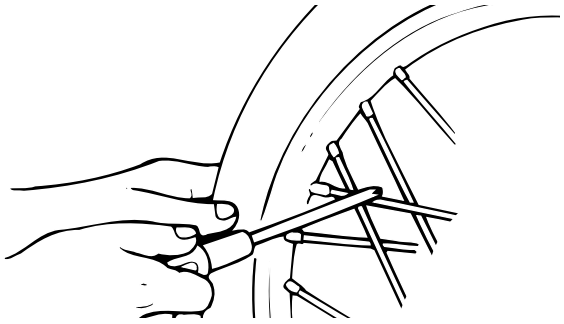
Never attempt to make any repairs to the wheel.

NOTE:
After a tire or wheel has been changed or replaced, always balance the wheel.

EAS21680
CHECKING AND TIGHTENING THE SPOKES

The following procedure applies to all of the spokes.

1. Check:
   - Spoke
     Bends/damage → Replace.
     Loose → Tighten.
     Tap the spokes with a screwdriver.

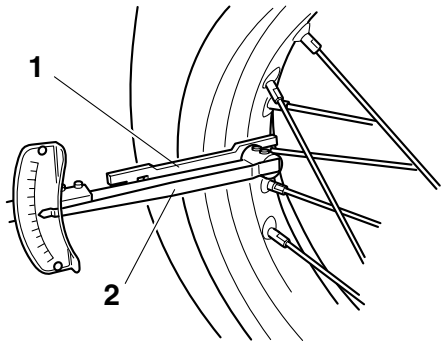


NOTE:

A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.

2. Tighten:
   - Spoke (Front/rear)
     (with a spoke wrench "1" and torque wrench "2")

	**Spoke (Front wheel)** **2 Nm (0.2 m•kg, 1.4 ft•lb)**
	**Spoke wrench** **90890-01522**



3. Tighten:
   - Spoke (Rear wheel)

	**Spoke (Rear wheel)** **4 Nm (0.4 m•kg, 2.9 ft•lb)**

NOTE:

Be sure to tighten the spokes before and after break-in.

EAS21690
CHECKING AND LUBRICATING THE CABLES

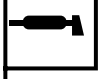
The following procedure applies to all of the inner and outer cables.

EWA13270

⚠ WARNING

Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
   - Outer cable
     Damage → Replace.
2. Check:
   - Cable operation
     Rough movement → Lubricate.

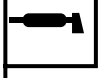
	**Recommended lubricant** **Engine oil or a suitable cable lubricant**

NOTE:

Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.

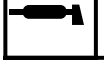
EAS21700
LUBRICATING THE LEVERS

Lubricate the pivoting point and metal-to-metal moving parts of the levers.

	**Clutch lever** **Lithium-soap-based grease** **Brake lever** **Silicone grease**

EAS21710
LUBRICATING THE PEDAL

Lubricate the pivoting point and metal-to-metal moving parts of the pedal.

	**Recommended lubricant** **Lithium-soap-based grease**

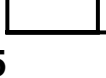
EAS21720
LUBRICATING THE SIDESTAND

Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.

	**Recommended lubricant** **Lithium-soap-based grease**

EAS21740
LUBRICATING THE REAR SUSPENSION

Lubricate the pivoting point and metal-to-metal moving parts of the rear suspension.

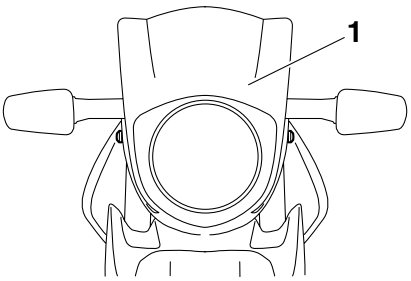
	**Recommended lubricant** **Molybdenum disulfide grease**

EAS21750
ELECTRICAL SYSTEM

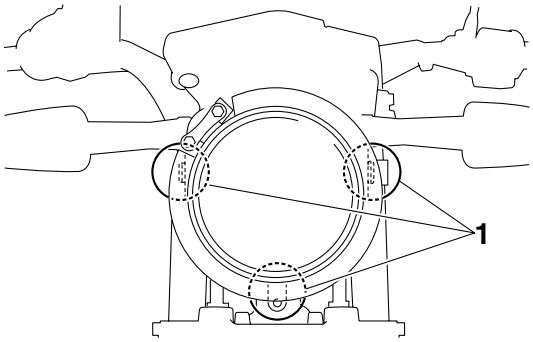
EAS21760
CHECKING AND CHARGING THE BATTERY
Refer to “ELECTRICAL COMPONENTS” on page 7-29.

EAS21770
CHECKING THE FUSES
Refer to “ELECTRICAL COMPONENTS” on page 7-29.

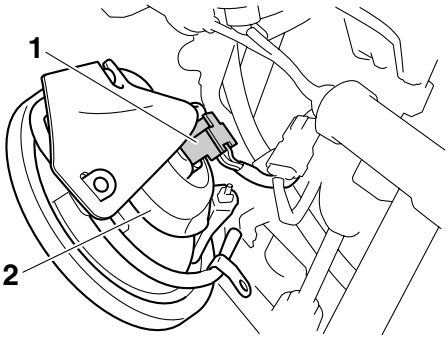
EAS21780
REPLACING THE HEADLIGHT BULB
1. Remove:
   - Headlight cowling “1”



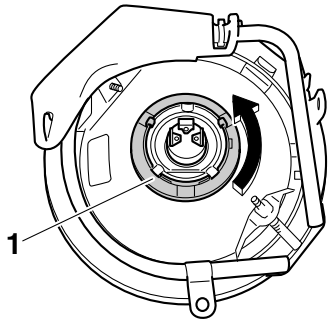
2. Remove:
   - Headlight unit bolts “1”



3. Disconnect:
   - Headlight coupler “1”
   - Bulb cover “2”



4. Remove:
   - Headlight bulb holder “1”



EWA13320
WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

5. Install:
   - Headlight bulb New
     Secure the new headlight bulb with the headlight bulb holder.

ECA13690
CAUTION:

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

6. Install:
   - Headlight bulb holder
   - Bulb cover
   - Headlight coupler
7. Install:
   - Headlight unit

	**Headlight unit bolt** **7 Nm (0.7 m•kg, 5.1 ft•lb)**

EAS21800
ADJUSTING THE HEADLIGHT BEAM
1. Adjust:
   - Headlight beam (vertically)

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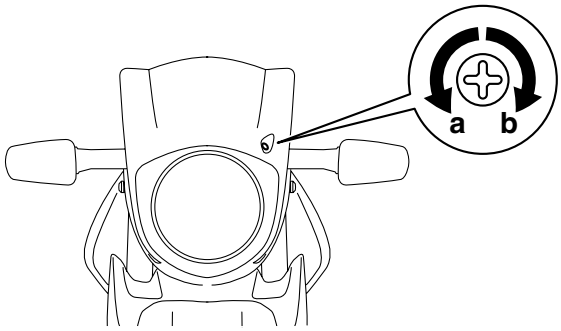
a. Turn the adjusting screw “1” in direction “a” or “b”.

Direction “a”
Headlight beam is raised.
Direction “b”
Headlight beam is lowered.


a
b

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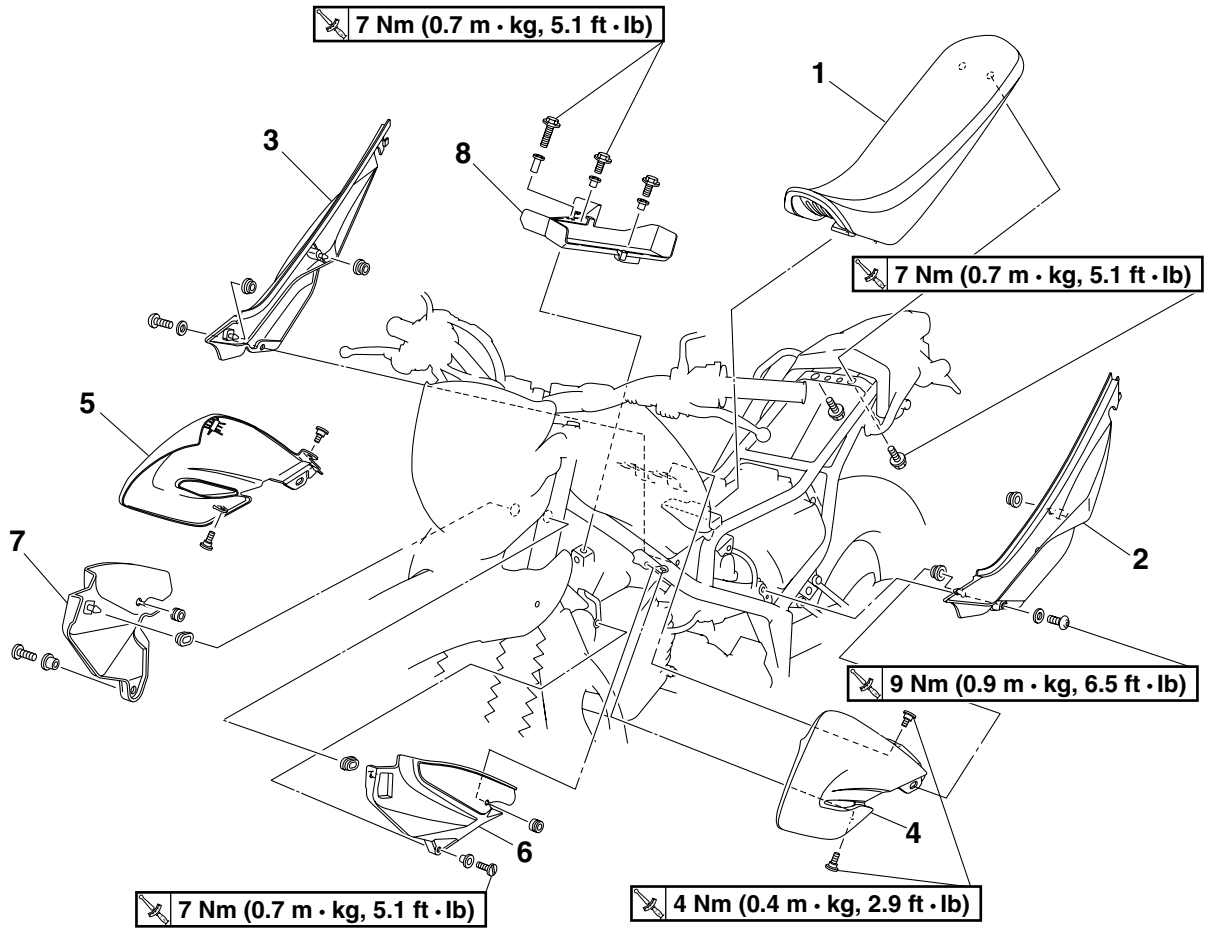
CHASSIS

EAS21830

GENERAL CHASSIS

Removing the cowling

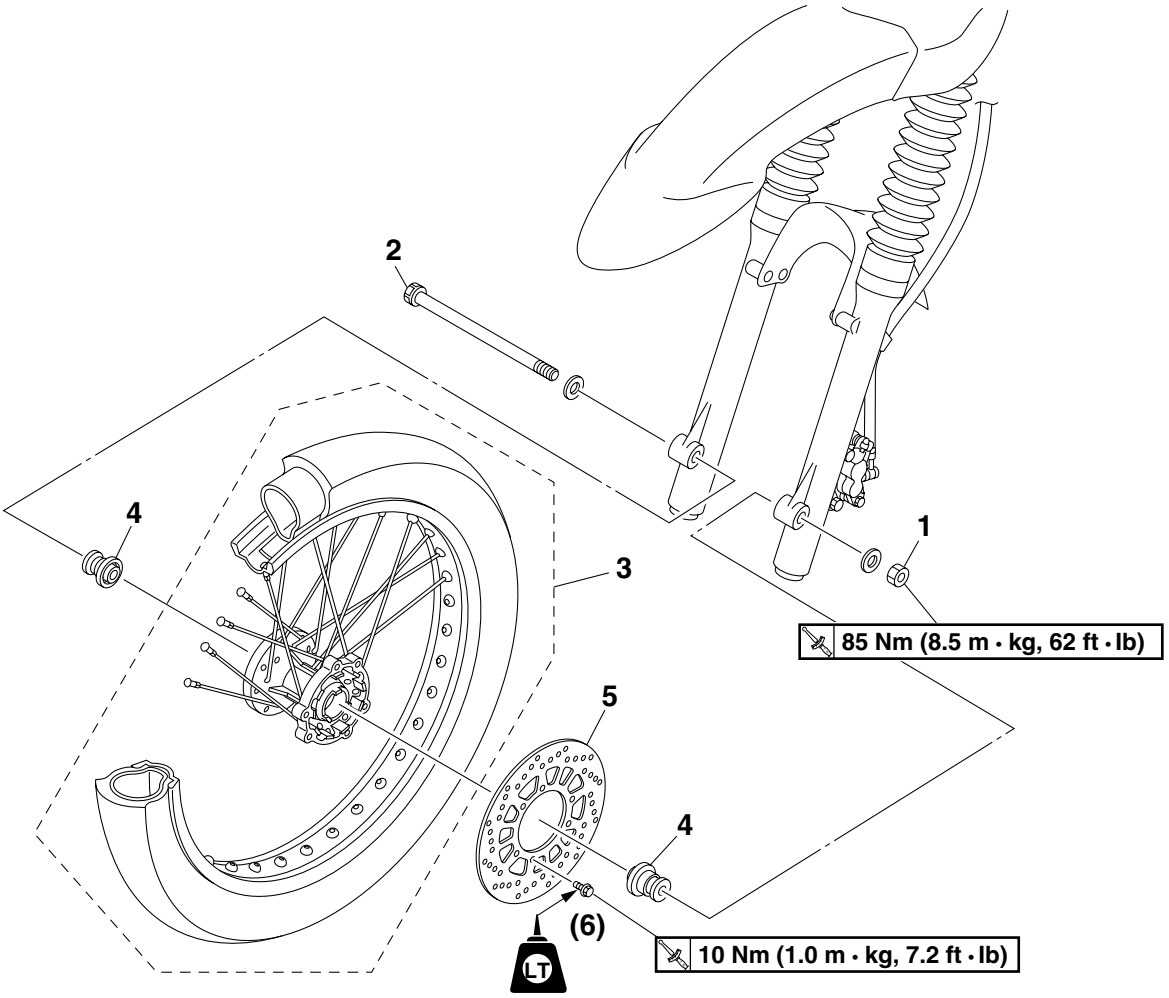


Order	Job/Parts to remove	Q'ty	Remarks
1	Seat	1	
2	Rear left side cover	1	
3	Rear right side cover	1	
4	Left fuel tank side cover	1	
5	Right fuel tank side cover	1	
6	Front left side cover	1	
7	Front right side cover	1	
8	Tool box	1	
			For installation, reverse the removal procedure.

EAS21870

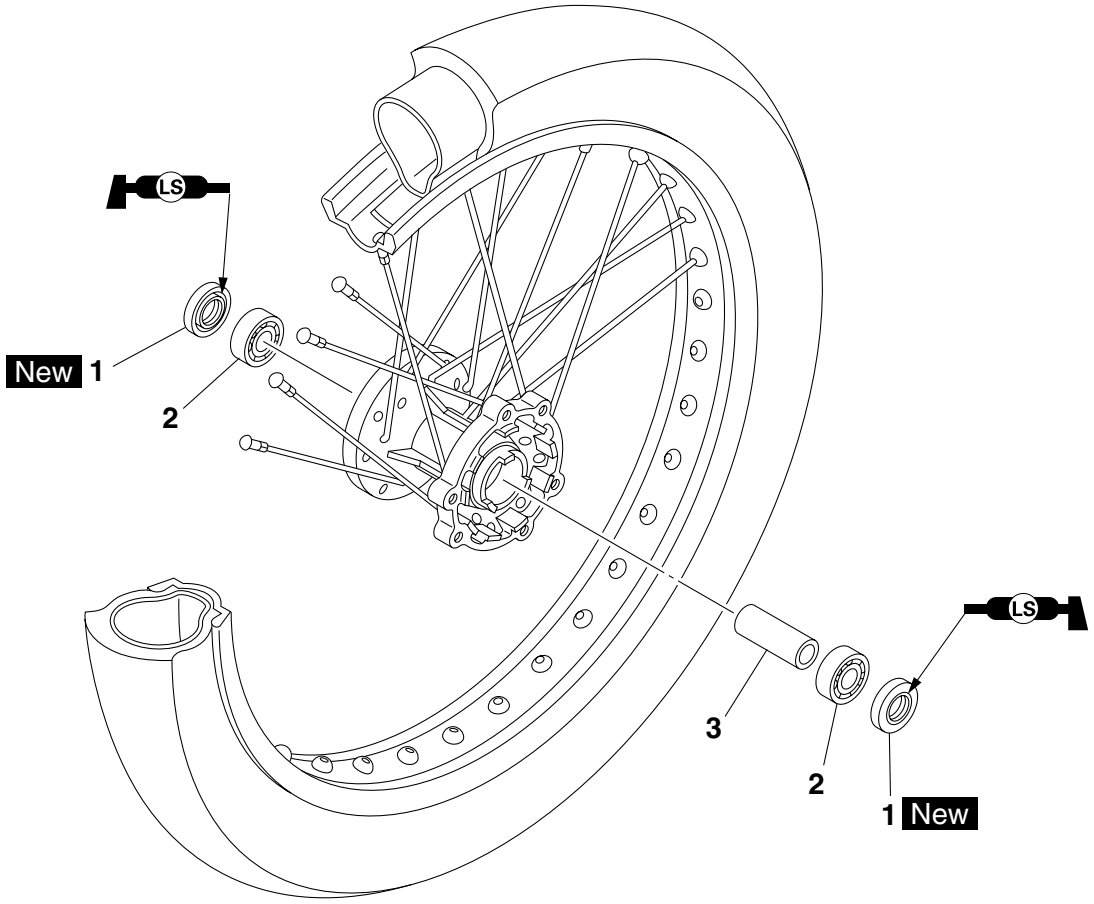
FRONT WHEEL

Removing the front wheel and brake disc



Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: Use a suitable stand to raise the front wheel off the ground.
1	Front wheel axle nut	1	
2	Front wheel axle	1	
3	Front wheel assembly	1	
4	Collar/dust seal	2/2	
5	Front brake disc	1	
			For installation, reverse the removal procedure.

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	2	
2	Wheel bearing	2	
3	Spacer	1	
			For assembly, reverse the disassembly procedure.

EAS21890
REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

2. Elevate:
   - Front wheel

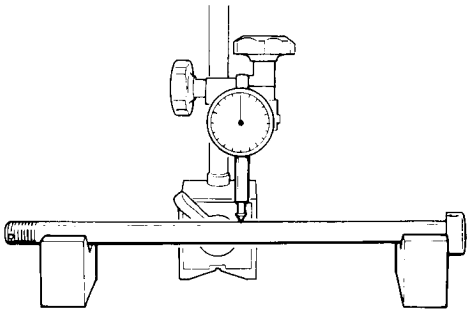
NOTE:
Place the vehicle on a suitable stand so that the front wheel is elevated.

EAS21930
CHECKING THE FRONT WHEEL

1. Check:
   - Front wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

EWA13460
⚠ WARNING

Do not attempt to straighten a bent wheel axle.



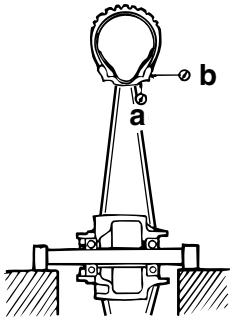
2. Check:
   - Tire
   - Front wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" on page 3-23 and "CHECKING THE WHEELS" on page 3-24.
3. Check:
   - Spokes
     Bends/damage → Replace.
     Loose → Tighten.
     Refer to "CHECKING AND TIGHTENING THE SPOKES" on page 3-25.

NOTE:
After tightening the spokes, measure the front wheel runout.

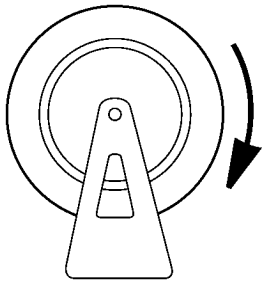
4. Measure:
   - Front wheel radial runout "a"
   - Front wheel lateral runout "b"

   Over the specified limits → Replace.

Radial wheel runout limit
2.0 mm (0.08 in)
Lateral wheel runout limit
2.0 mm (0.08 in)



5. Check:
   - Collars
     Damage/wear → Replace.
6. Check:
   - Wheel bearings
     Front wheel turns roughly or is loose → Replace the wheel bearings.
   - Oil seals
     Damage/wear → Replace.



EAS21910
DISASSEMBLING THE FRONT WHEEL

1. Remove:
   - Oil seals
   - Wheel bearings

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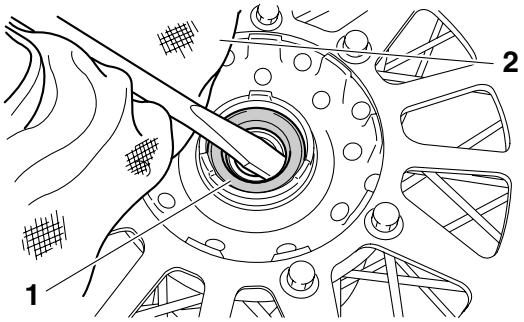
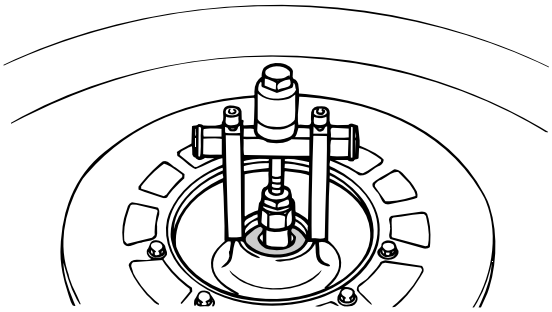
a. Clean the outside of the front wheel hub.
b. Remove the oil seals "1" with a flat-head screwdriver.

NOTE:
To prevent damaging the wheel, place a rag "2" between the screwdriver and the wheel surface.



c. Remove the wheel bearings with a general bearing puller.



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EAS21960

ASSEMBLING THE FRONT WHEEL

1. Install:
   - Wheel bearings
   - Oil seals New
   - Spacer

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a. Install the new wheel bearings and oil seals in the reverse order of disassembly.

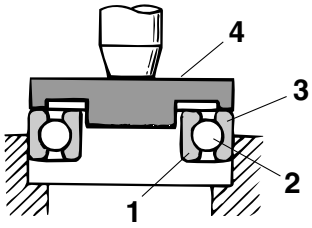
EC3C51001

CAUTION:

Do not contact the wheel bearing inner race "1"or balls "2". Support with the outer race "3".

NOTE:

Use a socket "4" that matches the diameter of the wheel bearing outer race and oil seal.



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EAS21970

ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:

- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

1. Remove:
   - Balancing weight(s)
2. Find:
   - Front wheel's heavy spot

NOTE:

Place the front wheel on a suitable balancing stand.

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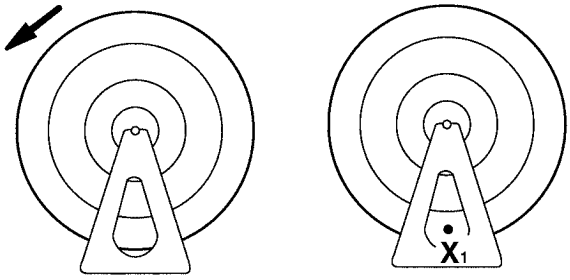
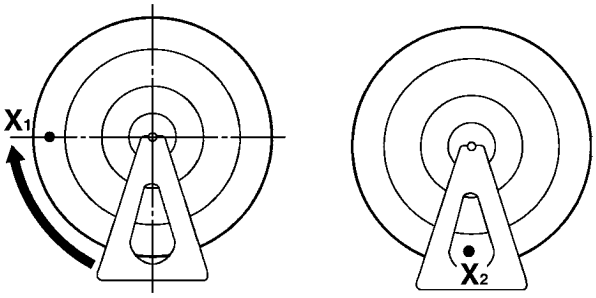
a. Spin the front wheel.
b. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.



c. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.
d. Release the front wheel.
e. When the wheel stops, put an "X_2" mark at the bottom of the wheel.



f. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.
g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

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3. Adjust:
   • Front wheel static balance

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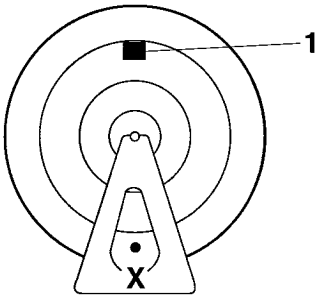
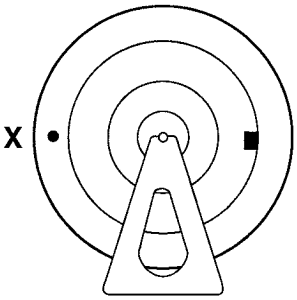
a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".



NOTE:
Start with the lightest weight.

b. Turn the front wheel 90° so that the heavy spot is positioned as shown.



c. If the heavy spot does not stay in that position, install a heavier weight.
d. Repeat steps (b) and (c) until the front wheel is balanced.

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4. Check:
   • Front wheel static balance

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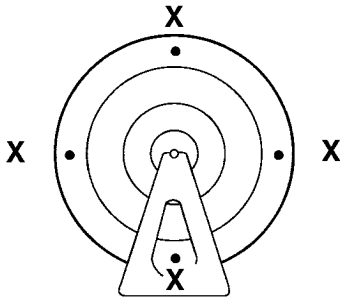
a. Turn the front wheel and make sure it stays at each position shown.



b. If the front wheel does not remain stationary at all of the positions, rebalance it.

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EAS22000

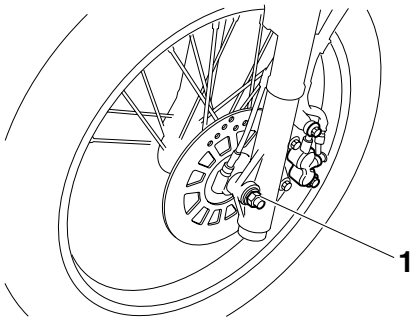
INSTALLING THE FRONT WHEEL (DISC)

The following procedure applies to both of the brake discs.

1. Install:
   • Front brake disc
   Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-17.
2. Lubricate:
   • Front wheel axle
   • Oil seal lips

	Recommended lubricant **Lithium-soap-based grease**

3. Tighten:
   • Front wheel axle nut "1"



	**Front axle nut** **85 Nm (8.5 m•kg, 62 ft•lb)**

EWA13500

⚠ WARNING

Make sure the brake hose is routed properly.

ECA14140

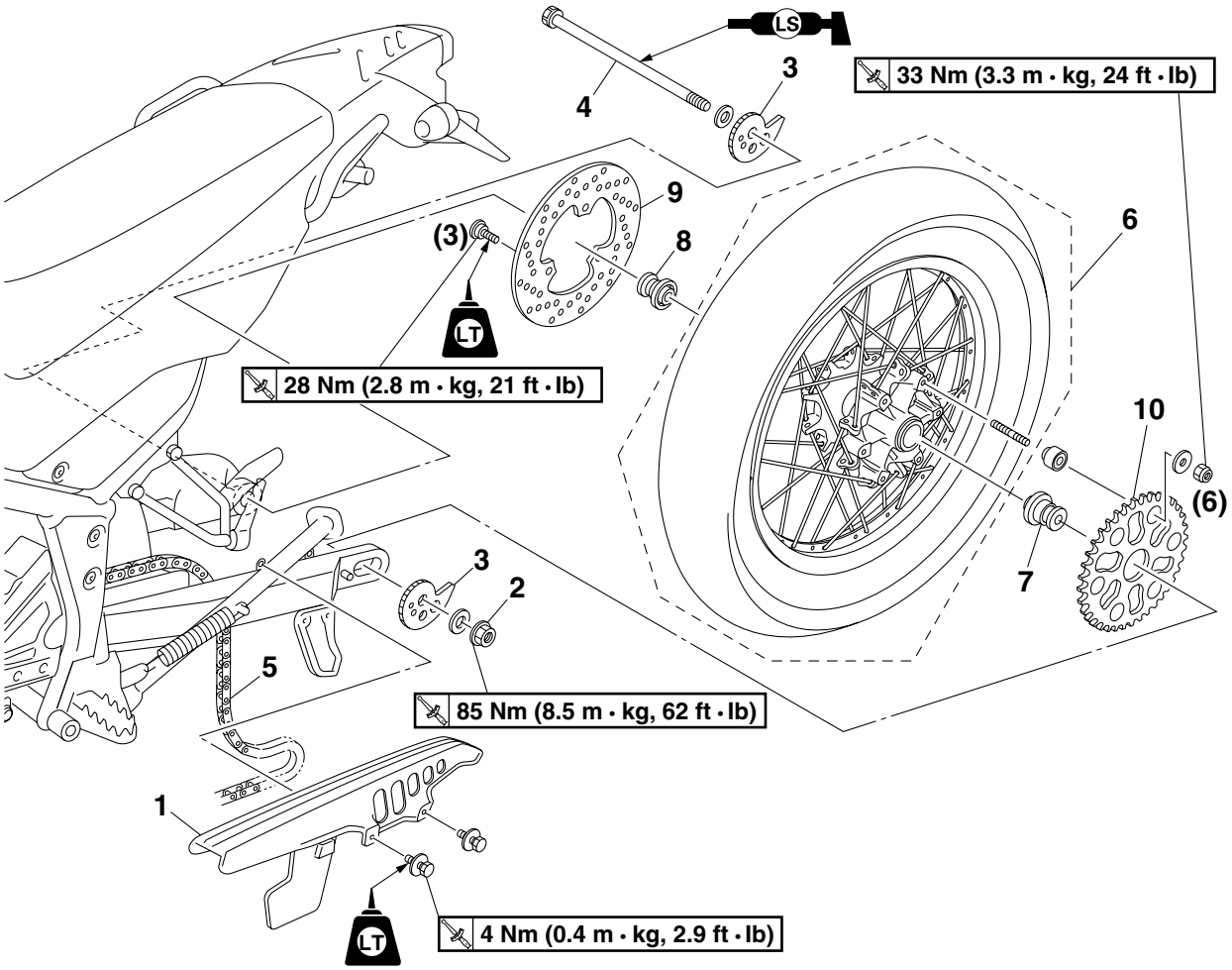
CAUTION:

Before tightening the wheel axle nut, push down hard on the handlebar(s) several times and check if the front fork rebounds smoothly.

EAS22020

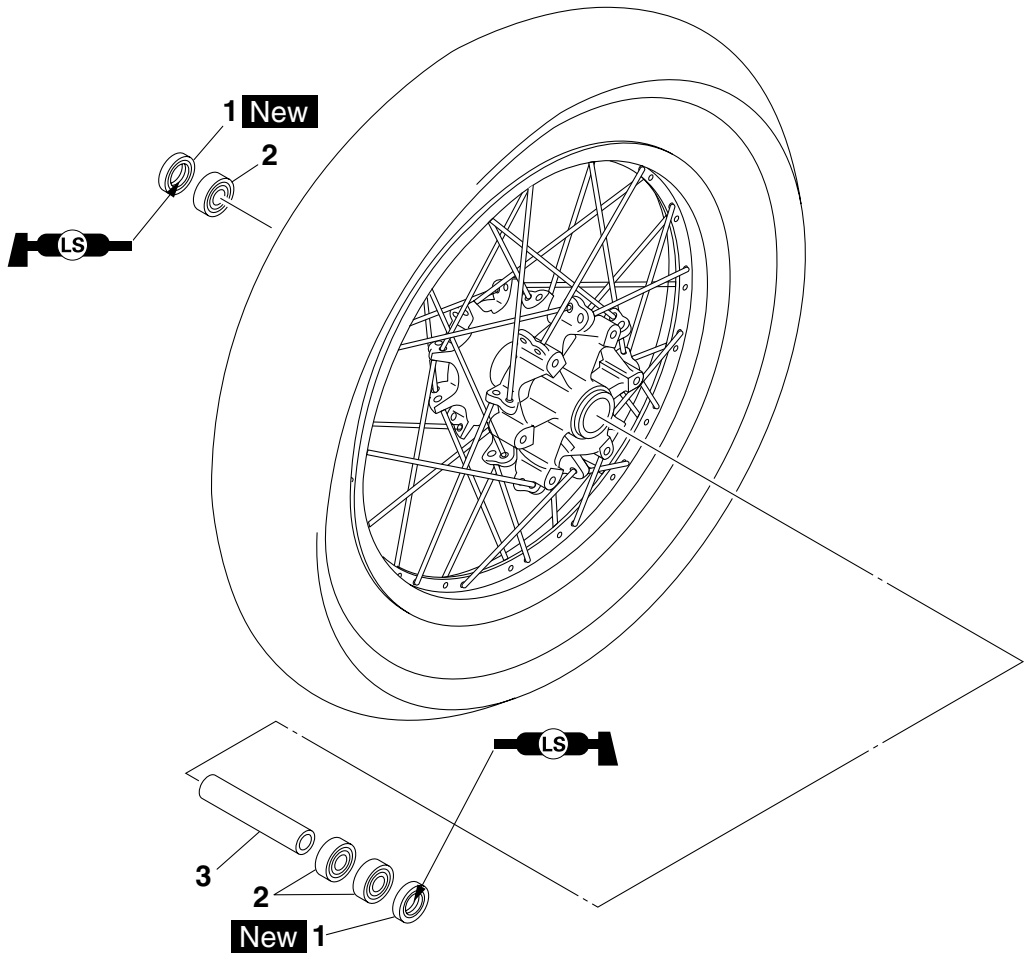
REAR WHEEL

Removing the rear wheel, brake disc and rear wheel sprocket



Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: Use a suitable stand to raise the rear wheel off the ground.
1	Drive chain case	1	
2	Rear wheel axle nut	1	
3	Drive chain adjusting plate	2	
4	Rear wheel axle	1	
5	Drive chain	1	
6	Rear wheel assembly	1	
7	Collar/dust cover	1/1	
8	Collar/dust cover	1/1	
9	Rear brake disc	1	
10	Rear wheel sprocket	1	
			For installation, reverse the removal procedure.

Disassembling the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	2	
2	Wheel bearing	3	
3	Spacer	1	
			For installation, reverse the removal procedure.

EAS22040
REMOVING THE REAR WHEEL (DISC)

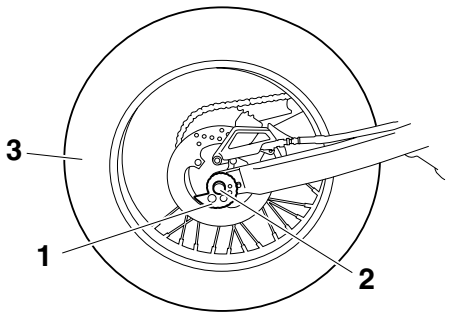
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Elevate:
   - Rear wheel
3. Remove:
   - Drive chain case
   - Rear wheel axle nut
   - Drive chain adjusting plate "1"
   - Rear wheel axle "2"
   - Rear wheel "3"



NOTE:
Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.

EAS22080
DISASSEMBLING THE REAR WHEEL

1. Remove:
   - Oil seals
   - Wheel bearings
     Refer to "DISASSEMBLING THE FRONT WHEEL" on page 4-4.

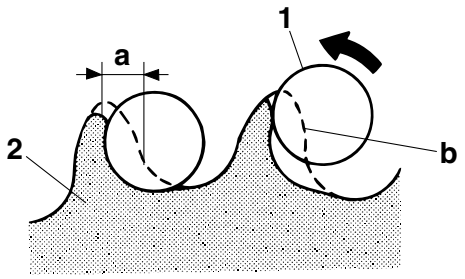
EAS22100
CHECKING THE REAR WHEEL

1. Check:
   - Rear wheel axle
   - Rear wheel
   - Wheel bearings
   - Oil seals
     Refer to "CHECKING THE FRONT WHEEL" on page 4-4.
2. Check:
   - Tire
   - Rear wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" on page 3-23 and "CHECKING THE WHEELS" on page 3-24.
3. Check:
   - Spokes
     Bends/damage → Replace.
     Loose → Tighten.
     Refer to "CHECKING THE FRONT WHEEL" on page 4-4.
4. Measure:
   - Radial rear wheel runout
   - Lateral rear wheel runout
     Refer to "CHECKING THE FRONT WHEEL" on page 4-4.

Radial wheel runout limit
2.0 mm (0.08 in)
Lateral wheel runout limit
2.0 mm (0.08 in)

EAS22120
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:
   - Rear wheel sprocket
     More than 1/4 tooth "a" wear → Replace the drive chain, drive sprocket, and rear wheel sprocket as a set.
     Bent teeth → Replace the drive chain, drive sprocket, and rear wheel sprocket as a set.



a. 1/4 wear
b. Correct

1. Drive chain roller
2. Rear wheel sprocket

2. Replace:
   - Rear wheel sprocket

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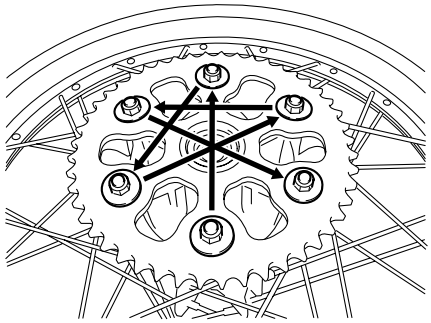
a. Remove the self-locking nuts and the rear wheel sprocket.
b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
c. Install the new rear wheel sprocket.

	Rear wheel sprocket self-locking nut **33 Nm (3.3 m•kg, 29 ft•lb)**

NOTE:

Tighten the self-locking nuts in stages and in a crisscross pattern.



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EAS22140

ASSEMBLING THE REAR WHEEL

1. Install:
   - Wheel bearings
   - Oil seals New
     Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-5.
   - Spacer

EAS22150

ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:

- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and drive sprocket installed.

1. Adjust:
   - Rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-5.

EAS22160

INSTALLING THE REAR WHEEL

1. Install:
   - Rear brake disc
     Refer to "CHECKING THE REAR BRAKE DISC" on page 4-29.
2. Lubricate:
   - Rear wheel axle
   - Oil seal lips

	Recommended lubricant **Lithium-soap-based grease**

3. Adjust:
   - Drive chain slack
     Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-20.

	Drive chain slack **40.0–45.0 mm (1.57–1.77 in)**

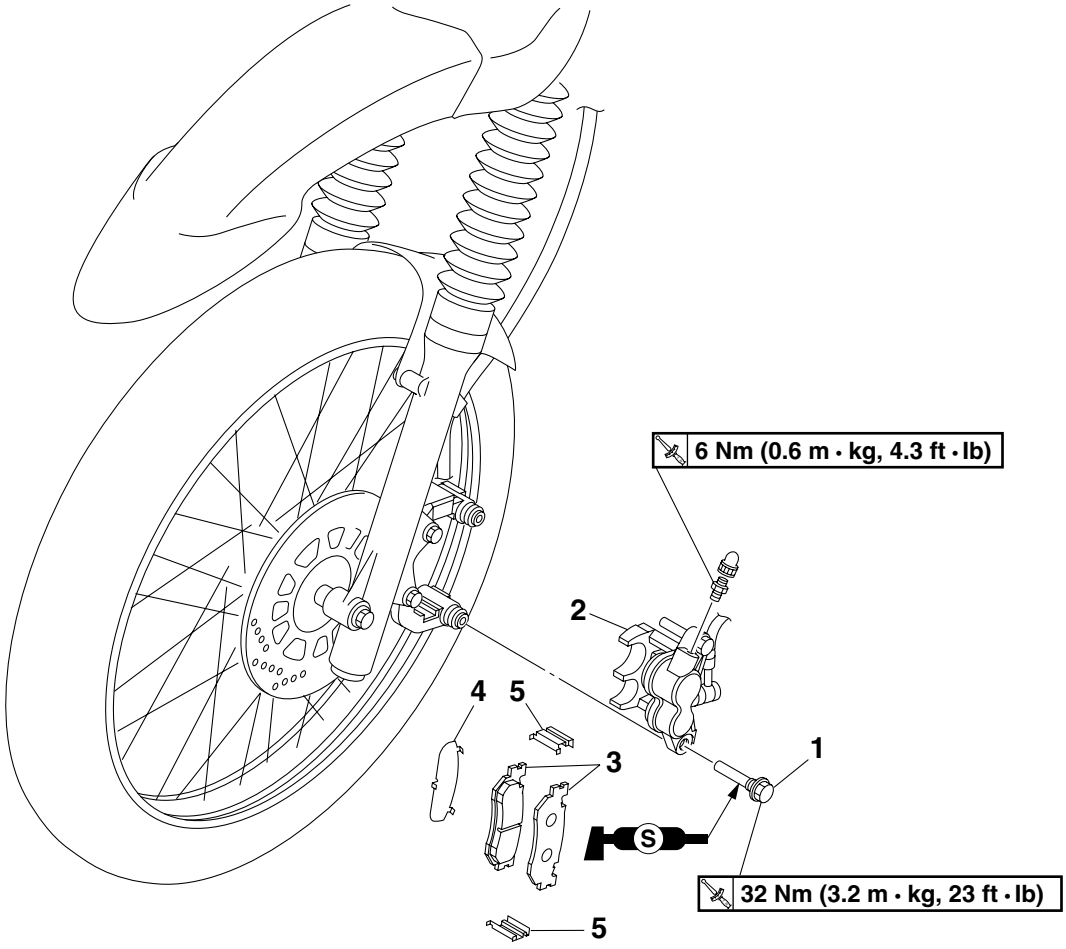
4. Tighten:
   - Rear wheel axle nut

	Rear wheel axle nut **85 Nm (8.5 m•kg, 62 ft•lb)**

EAS22210

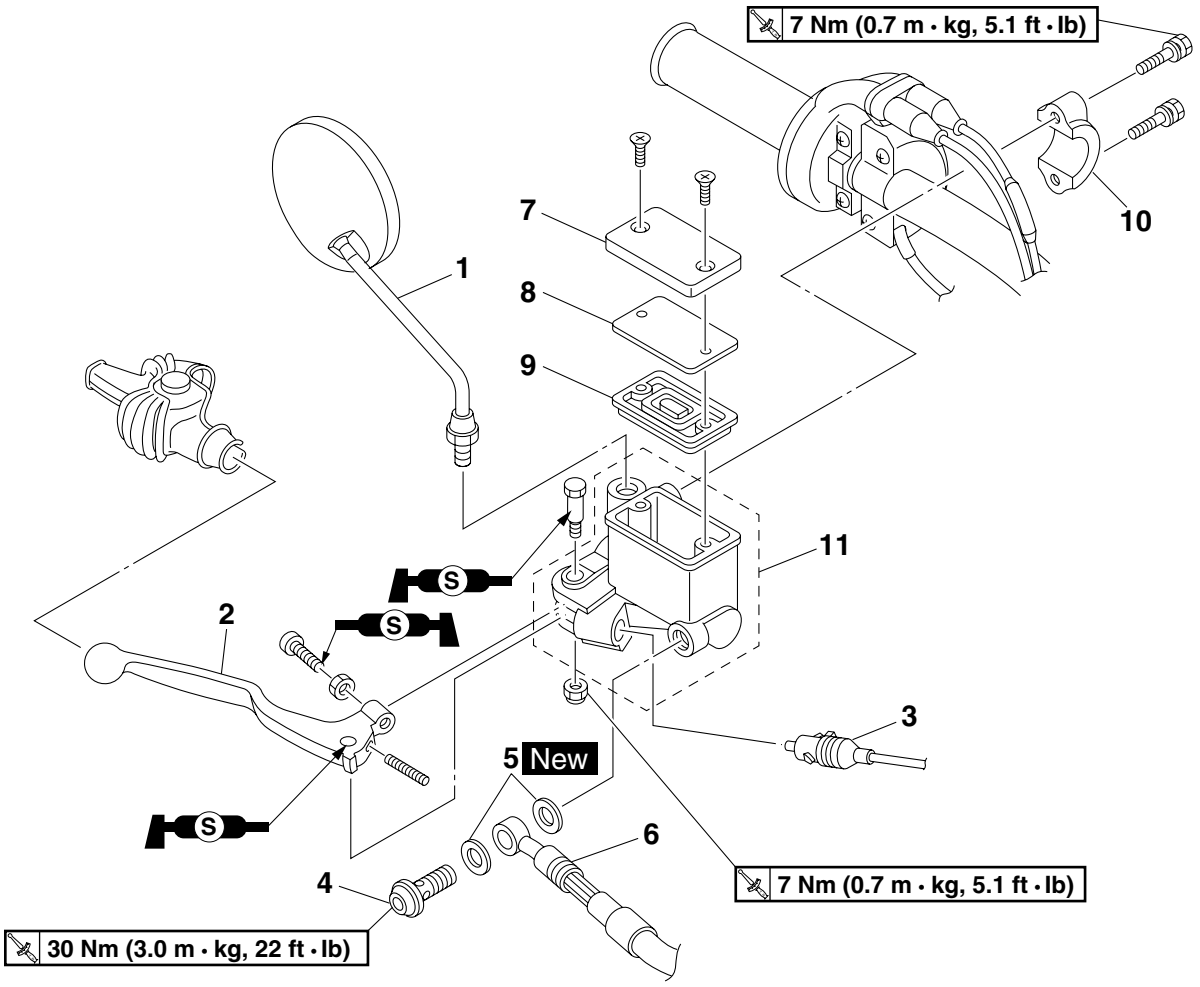
FRONT BRAKE

Removing the front brake pads



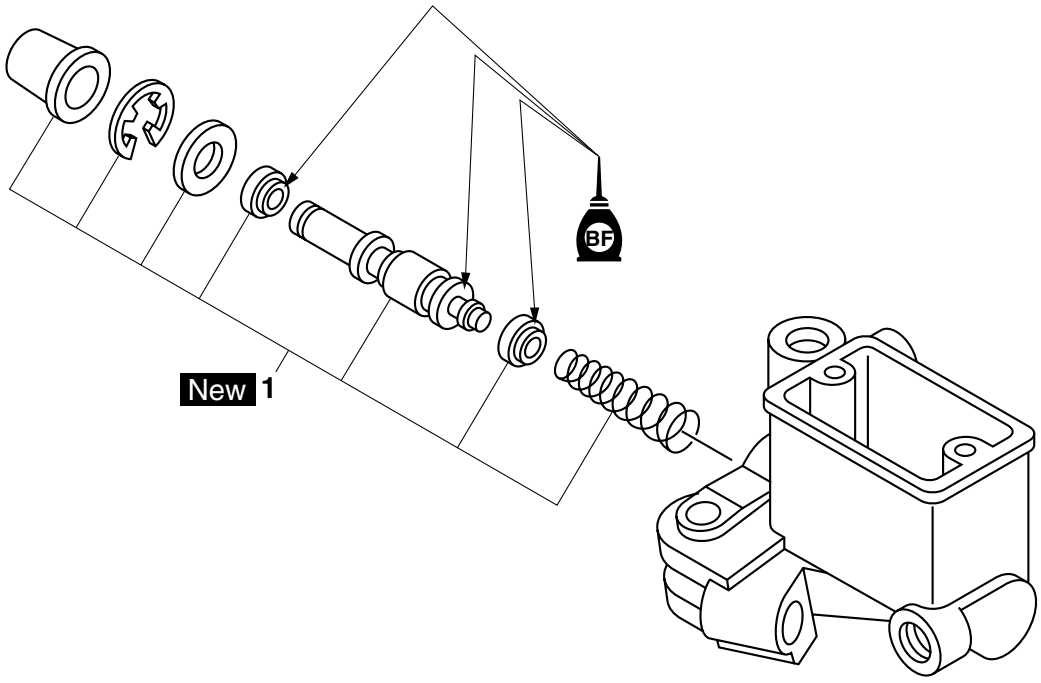
Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake caliper support bolt	1	**NOTE:** Remove the lower parts only.
2	Front brake caliper assembly	1	**NOTE:** Lift and remove the front brake caliper assembly.
3	Front brake pad	2	
4	Brake pad shim	1	
5	Brake pad spring	2	
			For installation, reverse the removal procedure.

Removing the front brake master cylinder



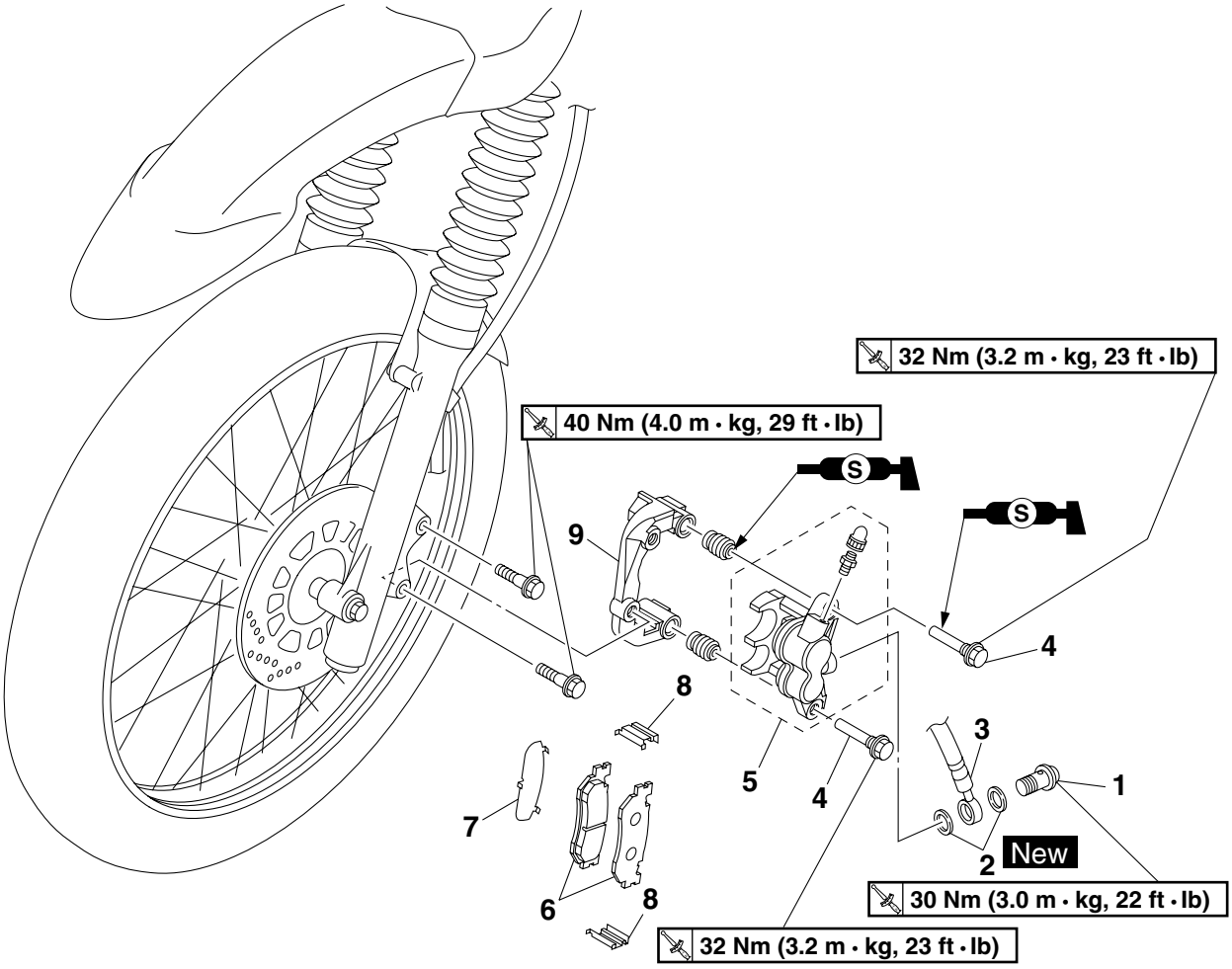
Order	Job/Parts to remove	Q'ty	Remarks
	Drain the brake fluid		Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
1	Right rear view mirror	1	
2	Brake lever	1	
3	Front brake light switch	1	
4	Union bolt	1	
5	Copper washer	2	
6	Front brake hose	1	
7	Brake master cylinder reservoir cap	1	
8	Brake master cylinder reservoir diaphragm holder	1	
9	Brake master cylinder reservoir diaphragm	1	
10	Front brake master cylinder holder	1	
11	Front brake master cylinder	1	
			For installation, reverse the removal procedure.

Disassembling the front brake master cylinder



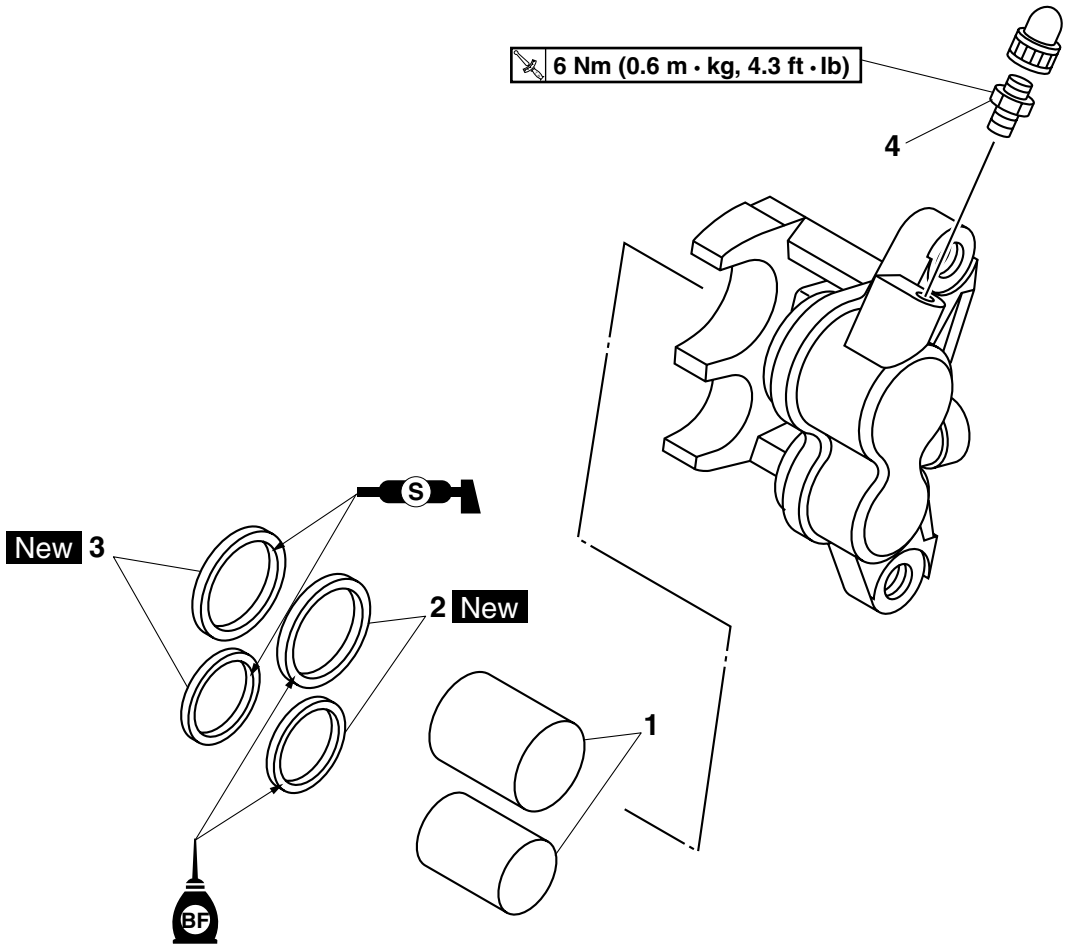
Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder kit	1	
			For assembly, reverse the disassembly procedure.

Removing the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
	Drain the brake fluid		Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
1	Union bolt	1	
2	Copper washer	2	
3	Front brake hose	1	
4	Front brake caliper support bolt	2	
5	Front brake caliper assembly	1	
6	Front brake pad	2	
7	Brake pad shim	1	
8	Brake pad spring	2	
9	Front brake caliper bracket	1	
			For installation, reverse the removal procedure.

Disassembling the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	2	
2	Brake caliper piston seal	2	
3	Brake caliper dust seal	2	
4	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

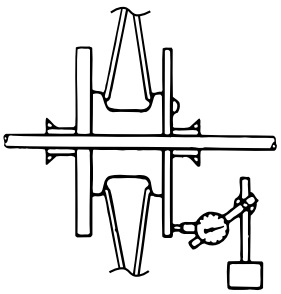
EAS22220
INTRODUCTION
EWA14100
⚠ WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:
- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.**
- **Never use solvents on internal brake components.**
- **Use only clean or new brake fluid for cleaning brake components.**

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- **Avoid brake fluid coming into contact with the eyes as it can cause serious injury.**

FIRST AID FOR BRAKE FLUID ENTERING THE EYES:
Flush with water for 15 minutes and get immediate medical attention.

EAS22230
CHECKING THE FRONT BRAKE DISC
1. Remove:
   - Front wheel
     Refer to "FRONT WHEEL" on page 4-2.
2. Check:
   - Front brake disc
     Damage/galling → Replace.
3. Measure:
   - Brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.



	Brake disc deflection limit **0.15 mm (0.0059 in)**

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a. Place the vehicle on a suitable stand so that the front wheel is elevated.
b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
c. Remove the brake caliper.
d. Hold the dial gauge at a right angle against the brake disc surface.
e. Measure the deflection at the point 13 mm (front brake) or 14 mm (rear brake) below the edge of brake disc.

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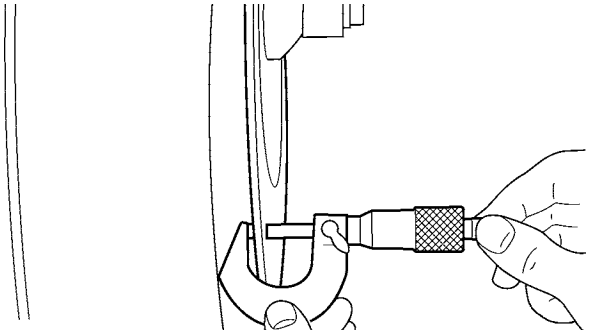
4. Measure:
   - Brake disc thickness
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.

	Brake disc thickness limit **3.0 mm (0.12 in)**



5. Adjust:
   - Brake disc deflection

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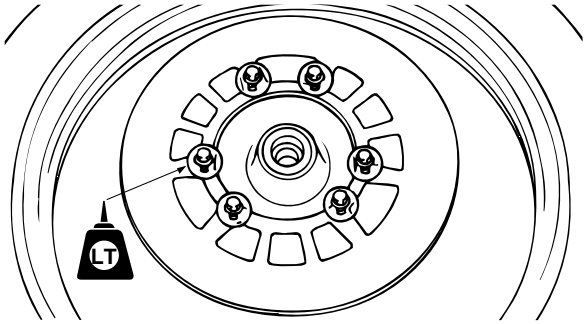
a. Remove the brake disc.
b. Turn the brake disc by one bolt hole.
c. Install the brake disc.

NOTE:
Tighten the brake disc bolts in stages and in a crisscross pattern.



Brake disc bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)
Apply locking agent (LOCTITE®)

d. Measure the brake disc deflection.
e. If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.
f. If the brake disc deflection cannot be brought within specification, replace the brake disc.

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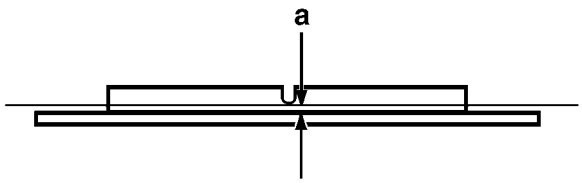
6. Install:
   • Front wheel
   Refer to "FRONT WHEEL" on page 4-2.

EAS22280
REPLACING THE FRONT BRAKE PADS

NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Measure:
   • Brake pad wear limit "a"
   Out of specification → Replace the brake pads as a set.

Brake pad lining thickness (inner)
5.3 mm (0.21 in)
Limit
0.8 mm (0.03 in)
Brake pad lining thickness (outer)
5.3 mm (0.21 in)
Limit
0.8 mm (0.03 in)



2. Install:
   • Brake pad shims
   (onto the inner brake pads)
   • Front brake pads
   • Brake pad spring

NOTE:
Always install new brake pads, brake pad shims, and a brake pad spring as a set.

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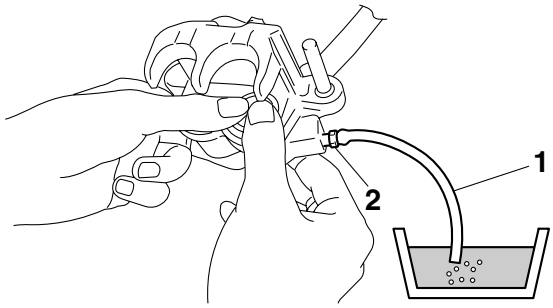
a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container. The oil pan must be under the hose end to receive the drain oil.
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.



c. Tighten the bleed screw.

Bleed screw
6 Nm (0.6 m•kg, 4.3 ft•lb)

d. Install new brake pads, new brake pad shims, and a new brake pad spring.

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3. Lubricate:
   • Front brake caliper support bolt

	Front brake caliper support bolt **Silicone grease**

ECA14150

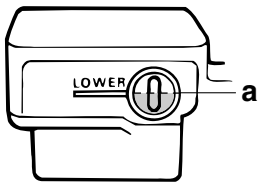
CAUTION:

- **Do not allow grease to contact the brake pads.**
- **Remove any excess grease.**

4. Install:
   - Front brake caliper

	Brake caliper support bolt **32 Nm (3.2 m•kg, 24 ft•lb)**

5. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-17.



6. Check:
   - Brake fluid level
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.

EAS22290

REMOVING THE FRONT BRAKE CALIPER

NOTE:

Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:
   - Union bolt
   - Copper washers
   - Brake hose

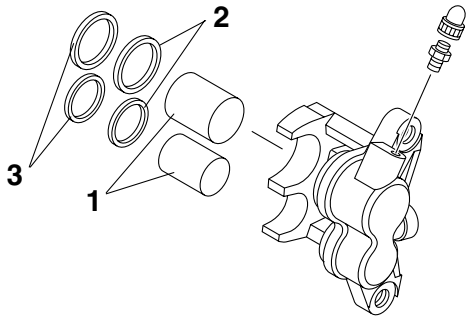
NOTE:

Put the end of the brake hose into a container and pump out the brake fluid carefully.

EAS22320

DISASSEMBLING THE FRONT BRAKE CALIPER

1. Remove:
   - Brake caliper pistons "1"
   - Brake caliper piston seals "2"
   - Brake caliper dust seals "3"



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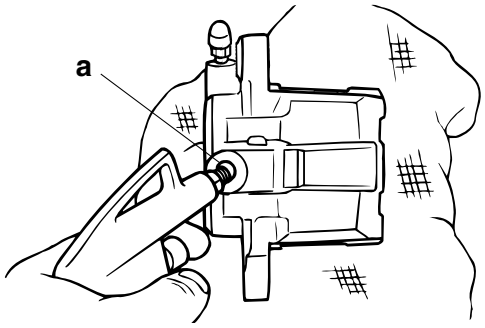
a. Blow compressed air into the brake hose joint opening "a" to force out the pistons from the brake caliper.

EWA13560

⚠ WARNING

- **Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**



b. Remove the brake caliper piston seals and dust seals.

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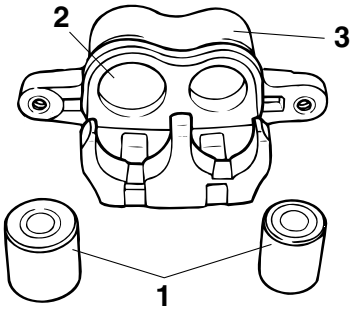
EAS22390

CHECKING THE FRONT BRAKE CALIPER

Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seals / dust seals	Every two years
Brake hoses	Every four years
Brake fluid	Every four years and whenever the brake is disassembled

1. Check:
   - Brake caliper pistons “1”
     Rust/scratches/wear → Replace the brake caliper pistons.
   - Brake caliper cylinders “2”
     Scratches/wear → Replace the brake caliper assembly.
   - Brake caliper body “3”
     Cracks/damage → Replace the brake caliper assembly.
   - Brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.



EWA13610
WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston seals.

2. Check:
   - Brake caliper bracket
     Cracks/damage → Replace.

EAS22400
ASSEMBLING THE FRONT BRAKE CALIPER

EWA13620
WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

	Recommended fluid **DOT 4**

EAS22420
INSTALLING THE FRONT BRAKE CALIPER

1. Install:
   - Front brake caliper bracket
   - Front brake caliper (temporarily)
   - Copper washers **New**
   - Front brake hose
   - Union bolt

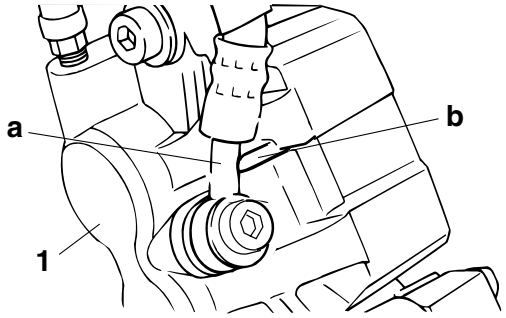
	Front brake caliper bracket bolt **40 Nm (4.0 m•kg, 29 ft•lb)** **Union bolt** **30 Nm (3.0 m•kg, 22 ft•lb)**

EWA13530
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-25.

ECA14170
CAUTION:

When installing the brake hose onto the brake caliper “1”, make sure the brake pipe “a” touches the projection “b” on the brake caliper.



2. Remove:
   - Front brake caliper
3. Install:
   - Brake pad springs
   - Front brake pad
   - Front brake caliper
   - Brake caliper support bolt
     Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-18.

	Brake caliper support bolt **32 Nm (3.2 m•kg, 23 ft•lb)**

4. Fill:
   - Brake master cylinder reservoir (with the specified amount of the recommended brake fluid)

	Recommended fluid **DOT 4**

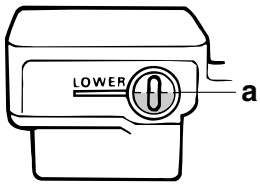
EWA13090
WARNING

- **Use only the designated brake fluid. Other**

brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540
CAUTION:
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
6. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-17.

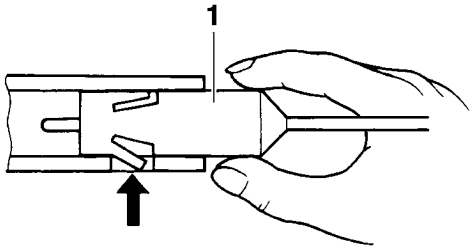


7. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.

EAS22490
REMOVING THE FRONT BRAKE MASTER CYLINDER
NOTE:
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Disconnect:
   - Front brake light switch "1"
     (from the brake switch)

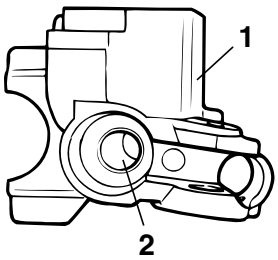
NOTE:
Remove the master cylinder by pressing the projection.



2. Remove:
   - Union bolt
   - Copper washers
   - Front brake hose

NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

EAS22500
CHECKING THE FRONT BRAKE MASTER CYLINDER
1. Check:
   - Front brake master cylinder "1"
     Damage/scratches/wear → Replace.
   - Brake fluid delivery passages "2"
     (brake master cylinder body)
     Obstruction → Blow out with compressed air.



2. Check:
   - Brake master cylinder kit "1"
     Damage/scratches/wear → Replace.
3. Check:
   - Brake master cylinder reservoir cap
   - Brake master cylinder reservoir diaphragm holder
   - Brake master cylinder reservoir diaphragm
     Cracks/damage → Replace.
4. Check:

- Front brake hose
  Cracks/damage/wear → Replace.

EAS22520
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

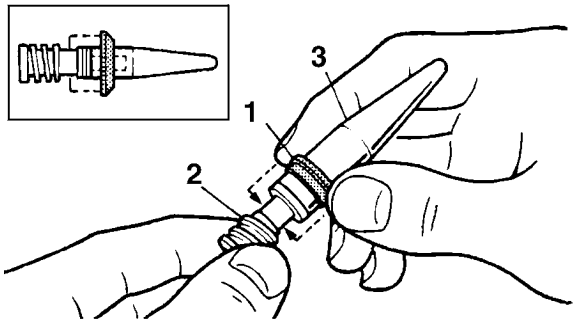
EWA13520
WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**

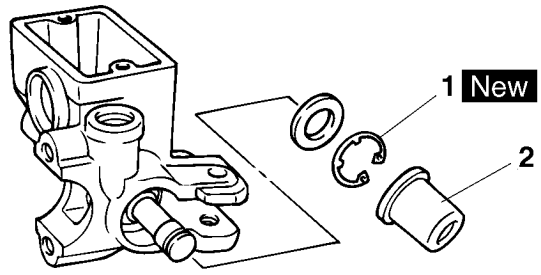
Recommended fluid
DOT 4

1. Install:
   - Cylinder cup "1" New
   - Master cylinder piston "2"
     Use the cylinder cup installer "3" for installation.

Cylinder cup installer
90890-01996



2. Install:
   - Master cylinder piston
   - Circlip "1" New
   - Dust boot "2"



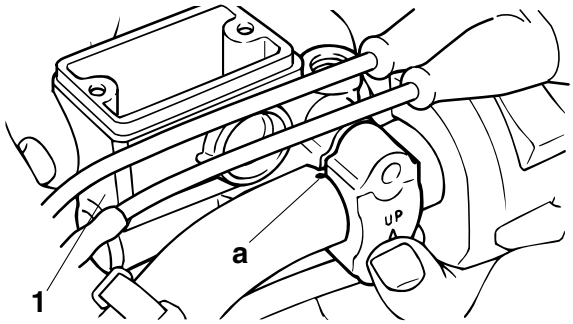
EAS22530
INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:
   - Front brake master cylinder "1"

Front brake master cylinder holder bolt
7 Nm (0.7 m•kg, 5.1 ft•lb)

NOTE:

- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark "a" on the handlebar.
- First, tighten the upper bolt, then the lower bolt.



2. Install:
   - Copper washers "1" New
   - Brake hose "2"
   - Union bolt "3"

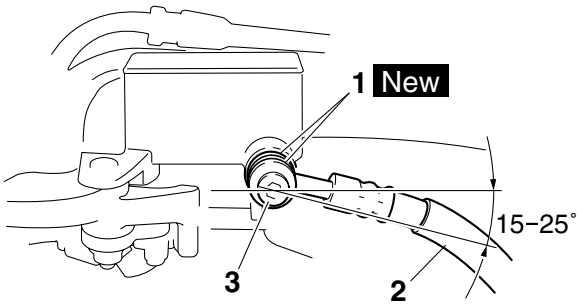
Union bolt
30 Nm (3.0 m•kg, 22 ft•lb)

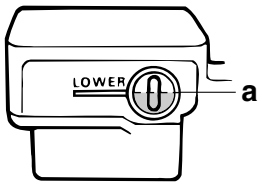
EWA13530
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-25.

NOTE:

- Hold the brake hose, and tighten the union bolt so that the hose comes within the angle as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.





3. Fill:
   - Brake master cylinder reservoir
     (with the specified amount of the recommended brake fluid)

	Recommended fluid **DOT 4**

EWA13540

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540

CAUTION:

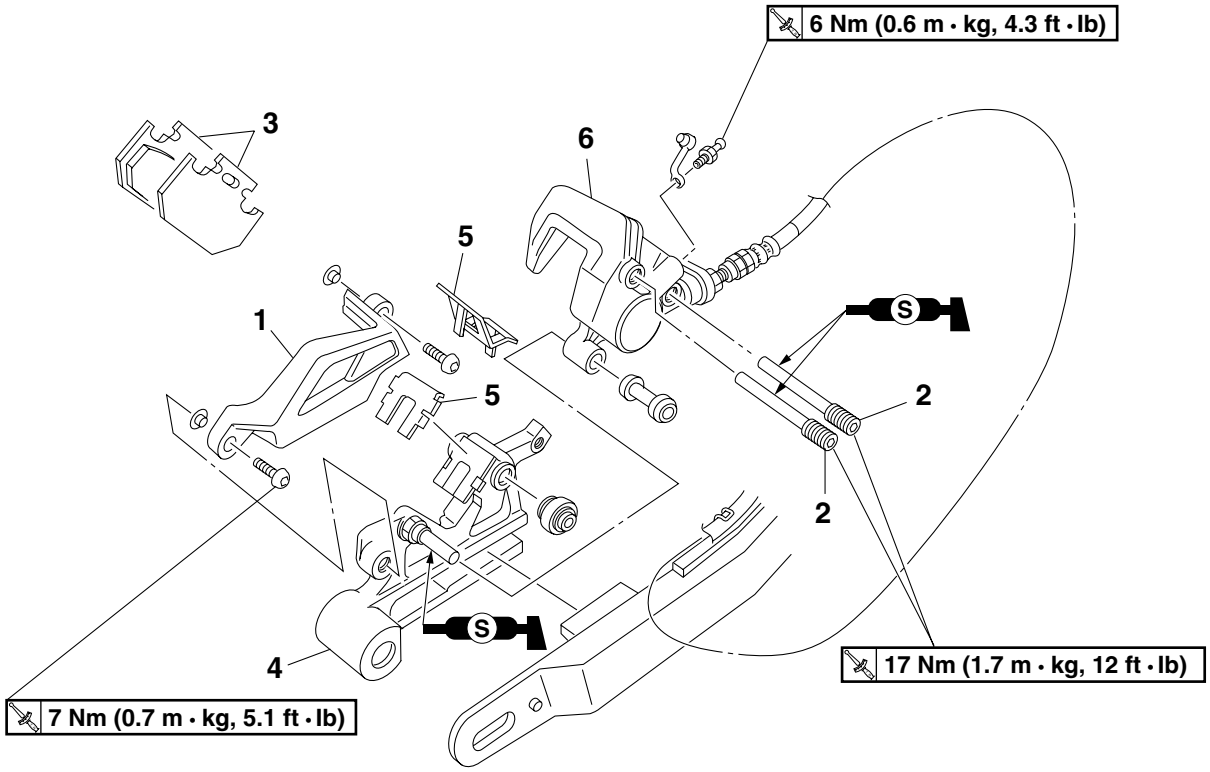
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
5. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-17.
6. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.

EAS22550

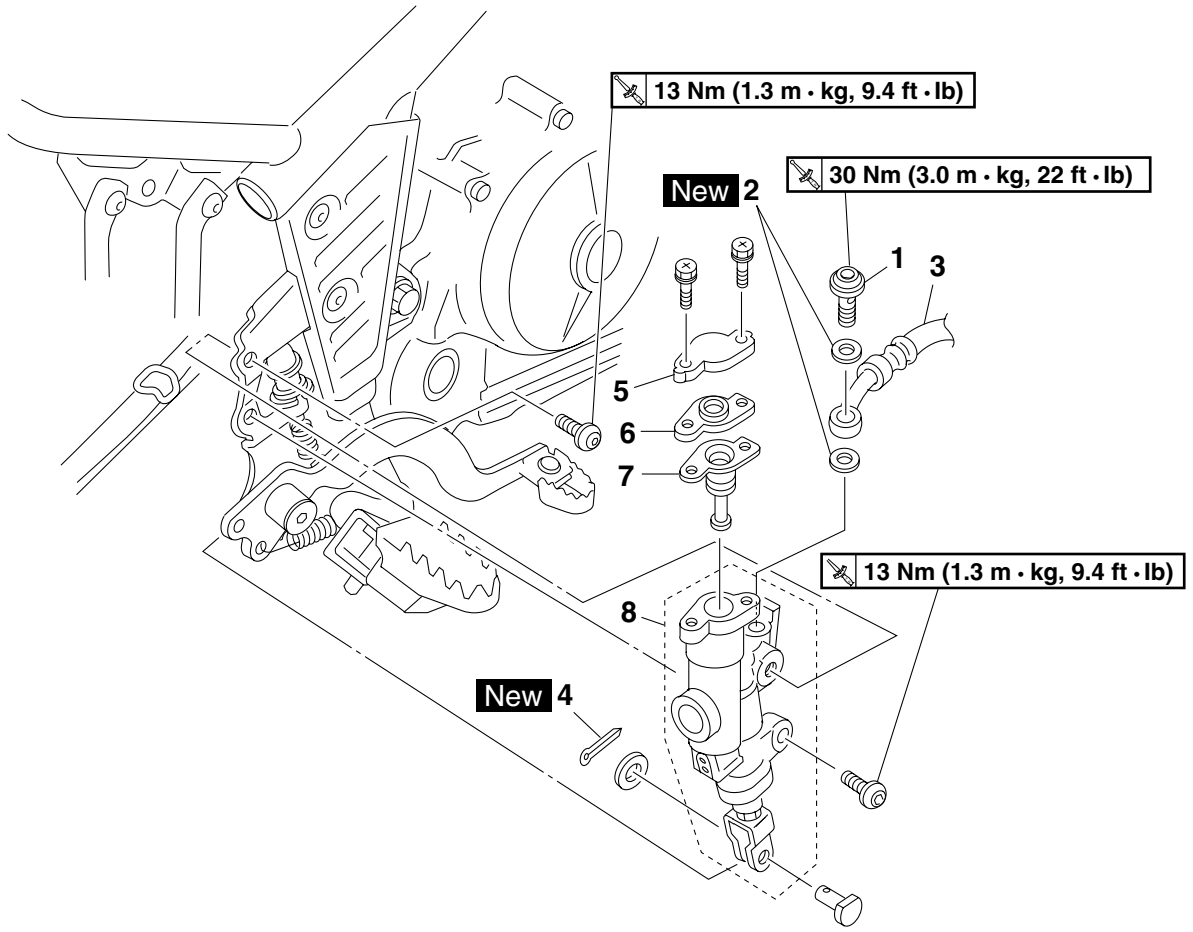
REAR BRAKE

Removing the rear brake pads



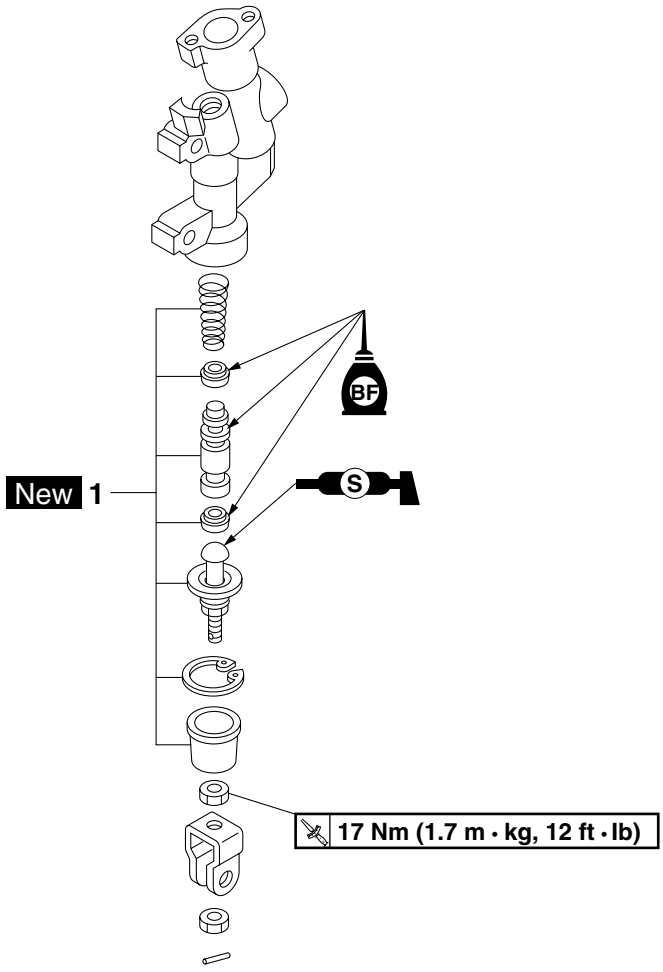
Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-8.
1	Rear brake caliper cover	1	
2	Brake pad support bolt	2	
3	Rear brake pad	2	
4	Rear brake caliper bracket	1	
5	Brake pad spring	2	
6	Rear brake caliper assembly	1	
			For installation, reverse the removal procedure.

Removing the rear brake master cylinder



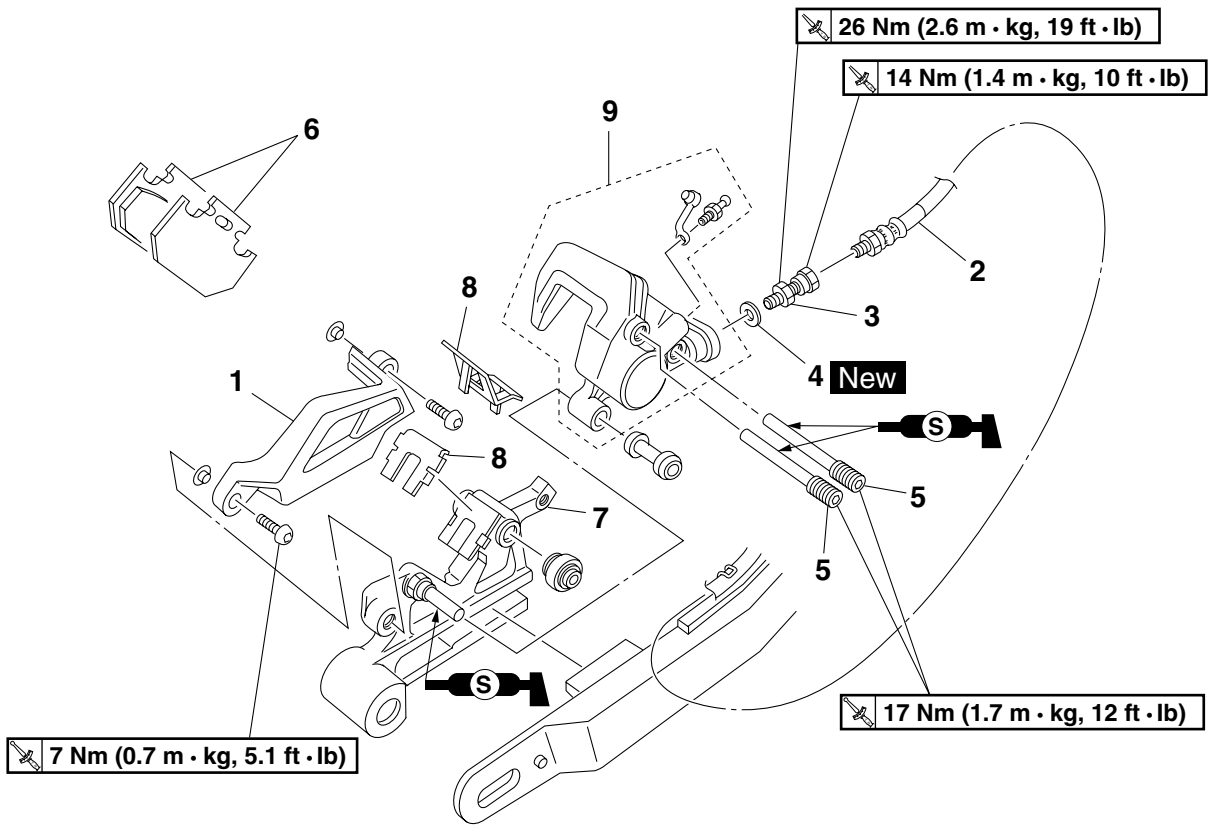
Order	Job/Parts to remove	Q'ty	Remarks
	Drain the brake fluid		Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
1	Union bolt	1	
2	Copper washer	2	
3	Rear brake hose	1	
4	Cotter pin	1	
5	Brake master cylinder reservoir cap	1	
6	Brake master cylinder reservoir diaphragm holder	1	
7	Brake master cylinder reservoir diaphragm	1	
8	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake master cylinder



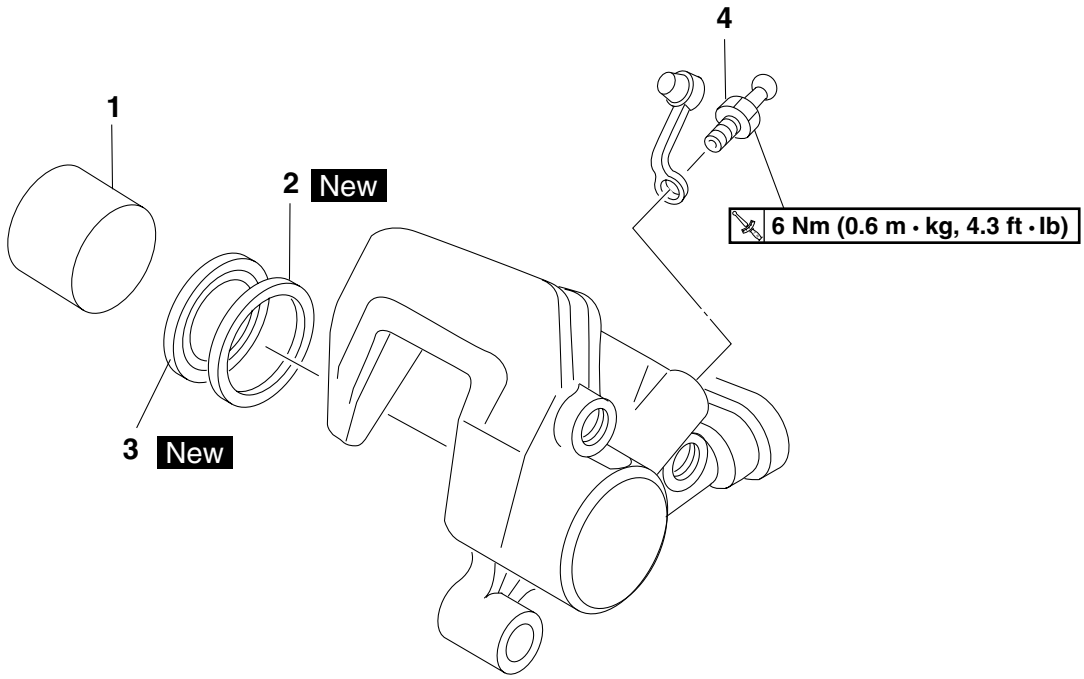
Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder kit	1	
			For assembly, reverse the disassembly procedure.

Removing the rear brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
	Drain the brake fluid		Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
	Rear wheel		Refer to "REAR WHEEL" on page 4-8.
1	Rear brake caliper cover	1	
2	Rear brake hose	1	
3	Brake hose joint	1	
4	Copper washer	1	
5	Brake pad support bolt	2	
6	Rear brake pad	2	
7	Rear brake caliper bracket	1	
8	Brake pad spring	2	
9	Rear brake caliper assembly	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	1	
2	Brake caliper piston seal	2	
3	Brake caliper dust seal	2	
4	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22560
INTRODUCTION
EWA14100
⚠ WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:
- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.**
- **Never use solvents on internal brake components.**
- **Use only clean or new brake fluid for cleaning brake components.**

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- **Avoid brake fluid coming into contact with the eyes as it can cause serious injury.**

FIRST AID FOR BRAKE FLUID ENTERING THE EYES:
Flush with water for 15 minutes and get immediate medical attention.

EAS22570
CHECKING THE REAR BRAKE DISC
1. Remove:
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-8.
2. Check:
   - Rear brake disk
     Damage/galling → Replace.
3. Measure:
   - Brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.
     Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-17.

Brake disc deflection limit
0.15 mm (0.0059 in)

4. Measure:
   - Brake disc thickness
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.
     Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-17.

Brake disc thickness limit
4.0 mm (0.16 in)

5. Adjust:
   - Brake disc deflection
     Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-17.

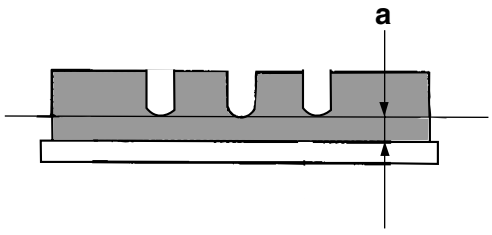
Brake disc bolt
28 Nm (2.8 m•kg, 21 ft•lb)
Apply locking agent (LOCTITE®)

6. Install:
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-8.

EAS22580
REPLACING THE REAR BRAKE PADS
NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Measure:
   - Brake pad wear limit "a"
     Out of specification → Replace the brake pads as a set.

Brake pad lining thickness (inner)
5.2 mm (0.20 in)
Limit
1.0 mm (0.04 in)
Brake pad lining thickness (outer)
5.2 mm (0.20 in)
Limit
1.0 mm (0.04 in)



2. Lubricate:
   - Support pin
     (Rear brake caliper or rear brake caliper bracket)
   - Brake pad support bolt

	Brake pad support bolt **Silicone grease**

ECA14150

CAUTION:

- **Do not allow grease to contact the brake pads.**
- **Remove any excess grease.**

3. Install:
   - Rear brake pad
   - Brake pad spring
   - Rear brake caliper bracket

NOTE:

Always install new brake pads, brake pad shims, and a brake pad spring as a set.

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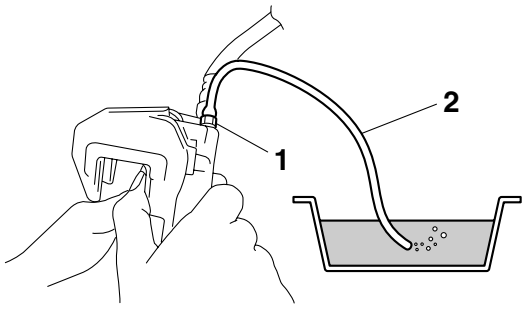
a. Connect a clear plastic hose "2" tightly to the bleed screw "1". Put the other end of the hose into an open container. The oil pan must be under the hose end to receive the drain oil.
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.



c. Tighten the bleed screw.

	Bleed screw **6 Nm (0.6 m•kg, 4.3 ft•lb)**

d. Install new brake pads and a new brake pad spring.

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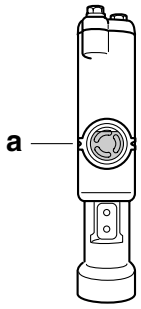
4. Install:
   - Brake pad support bolt
   - Rear brake caliper cover

	Brake pad support bolt **17 Nm (1.7 m•kg, 13 ft•lb)** **Rear brake caliper cover bolt** **7 Nm (0.7 m•kg, 5.1 ft•lb)**

5. Check:
   - Brake fluid level

   Below minimum level mark "a" → Add the recommended brake fluid to proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-17.



6. Check:
   - Brake pedal operation

   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.

EAS22590

REMOVING THE REAR BRAKE CALIPER

NOTE:

Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:
   - Rear brake hose
   - Brake hose joint
   - Copper washers

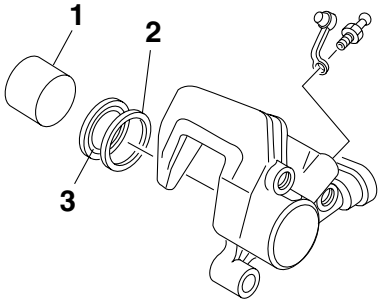
NOTE:

Put the end of the brake hose into a container and pump out the brake fluid carefully.

EAS22600

DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:
   - Brake caliper piston "1"
   - Brake caliper piston seal "2"
   - Brake caliper dust seal "3"



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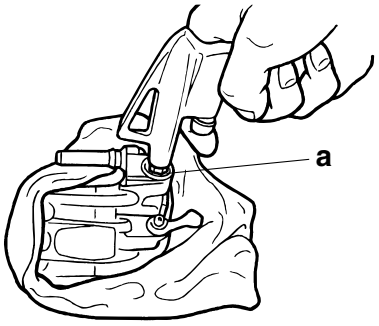
a. Blow compressed air into the brake hose joint opening "a" to force out the piston from the brake caliper.

EWA13560

⚠ WARNING

- **Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**



b. Remove the brake caliper piston seal and dust seal.

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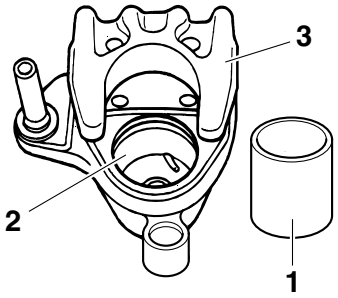
EAS22640

CHECKING THE REAR BRAKE CALIPER

Recommended brake component Replacement schedule	
Brake pads	If necessary
Piston seal/dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Every four years and whenever the brake is disassembled

1. Check:
   - Brake caliper pistons "1"
     Rust/scratches/wear → Replace the brake caliper pistons.
   - Brake caliper cylinders "2"
     Scratches/wear → Replace the brake caliper assembly.
   - Brake caliper body "3"
     Cracks/damage → Replace the brake caliper assembly.
   - Brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.



EWA13610

⚠ WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston seals.

2. Check:
   - Brake caliper brackets "1"
     Cracks/damage → Replace.

EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA13620

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

	Recommended fluid DOT 4

EAS22670

INSTALLING THE REAR BRAKE CALIPER

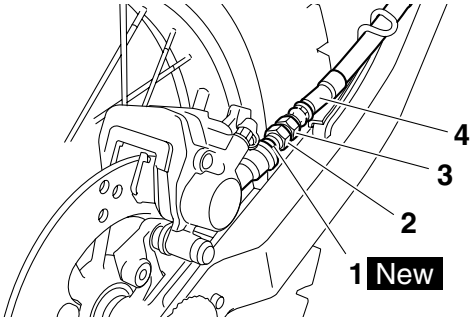
1. Install:
   - Rear brake caliper
   - Rear brake caliper bracket
2. Rear wheel (temporarily)
   Refer to "REAR WHEEL" on page 4-8.
3. Install:
   - Copper washer "1" New
   - Brake hose joint "2"
   - Locknut "3"
   - Rear brake hose "4"

	Brake hose joint (caliper side) **26 Nm (2.6 m•kg, 19 ft•lb)** **Brake hose joint (hose side)** **14 Nm (1.4 m•kg, 10 ft•lb)**

EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-25.



4. Remove:
   - Rear wheel
   - Rear brake caliper bracket
   - Rear brake caliper
5. Install:
   - Brake pad springs
   - Rear brake caliper bracket
   - Rear brake pads
   - Brake pad support bolts
   - Brake caliper
   Refer to "REPLACING THE REAR BRAKE PADS" on page 4-29.

	Brake pad support bolt **17 Nm (1.7 m•kg, 13 ft•lb)**

6. Install:
   - Rear wheel
   Refer to "REAR WHEEL" on page 4-8.
7. Fill:
   (with the specified amount of the recommended brake fluid)
   - Brake master cylinder reservoir

	Recommended fluid **DOT 4**

EWA13090

WARNING

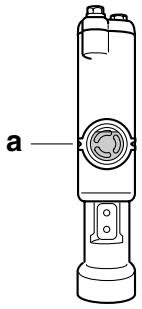
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

8. Bleed:
   - Brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
9. Check:
   - Brake fluid level
   Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-17.



10. Check:
    - Brake pedal operation
    Soft or spongy feeling → Bleed the brake system.
    Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.

EAS22700

REMOVING THE REAR BRAKE MASTER CYLINDER

Before disassembling the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:
   - Union bolt
   - Copper washers
   - Brake hose

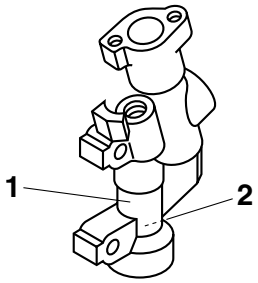
NOTE:

To collect any remaining brake fluid, place a

container under the master cylinder and the end of the brake hose.

EAS22710
CHECKING THE REAR BRAKE MASTER CYLINDER

1. Check:
   - Rear brake master cylinder "1"
     Damage/scratches/wear → Replace.
   - Brake fluid delivery passages "2" (brake master cylinder body)
     Obstruction → Blow out with compressed air.



2. Check:
   - Brake master cylinder kit "1"
     Damage/scratches/wear → Replace.

3. Check:
   - Brake master cylinder reservoir cap
   - Brake master cylinder reservoir diaphragm holder
   - Brake master cylinder reservoir diaphragm
     Cracks/damage → Replace.
4. Check:
   - Rear brake hose
     Cracks/damage/wear → Replace.

EAS22730
ASSEMBLING THE REAR BRAKE MASTER CYLINDER

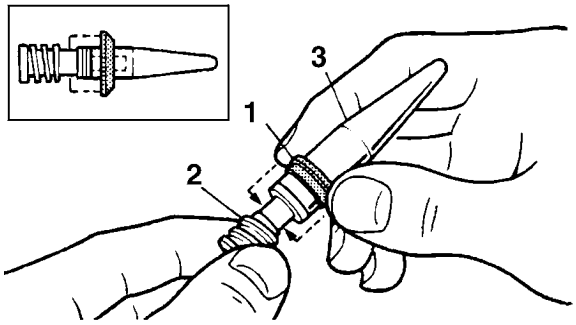
EWA13520
WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**

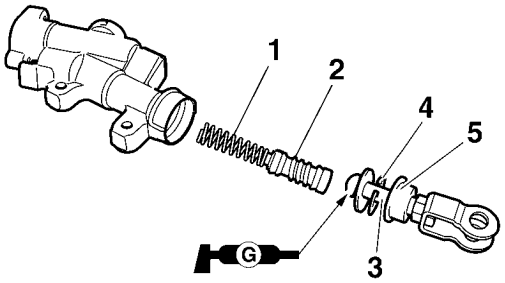
	Recommended fluid **DOT 4**

1. Install:
   - Cylinder cup "1" New
   - Master cylinder piston "2"
     Install it using with cylinder cup installer "3".

	Cylinder cup installer **90890-01996**



2. Assemble:
   - Spring"1"
   - Master cylinder piston "2"
   - Adjusting rod "3"
   - Circlip"4" New
   - Dust boot"5"



EAS22750
INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
   - Copper washers New
   - Brake hoses
   - Union bolt

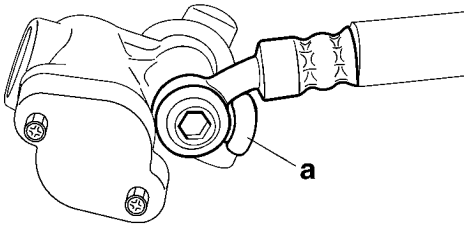
	Brake hose union bolt **30 Nm (3.0 m•kg, 22 ft•lb)**

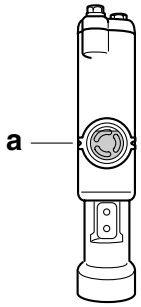
EWA13530
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-25.

ECA14160
CAUTION:

When installing the brake hose onto the brake master cylinder, make sure the brake pipe touches the projection "a" as shown.





2. Add the recommended brake fluid to the proper level.
   - Brake master cylinder reservoir

	Recommended fluid **DOT 4**

EWA13090

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540

CAUTION:

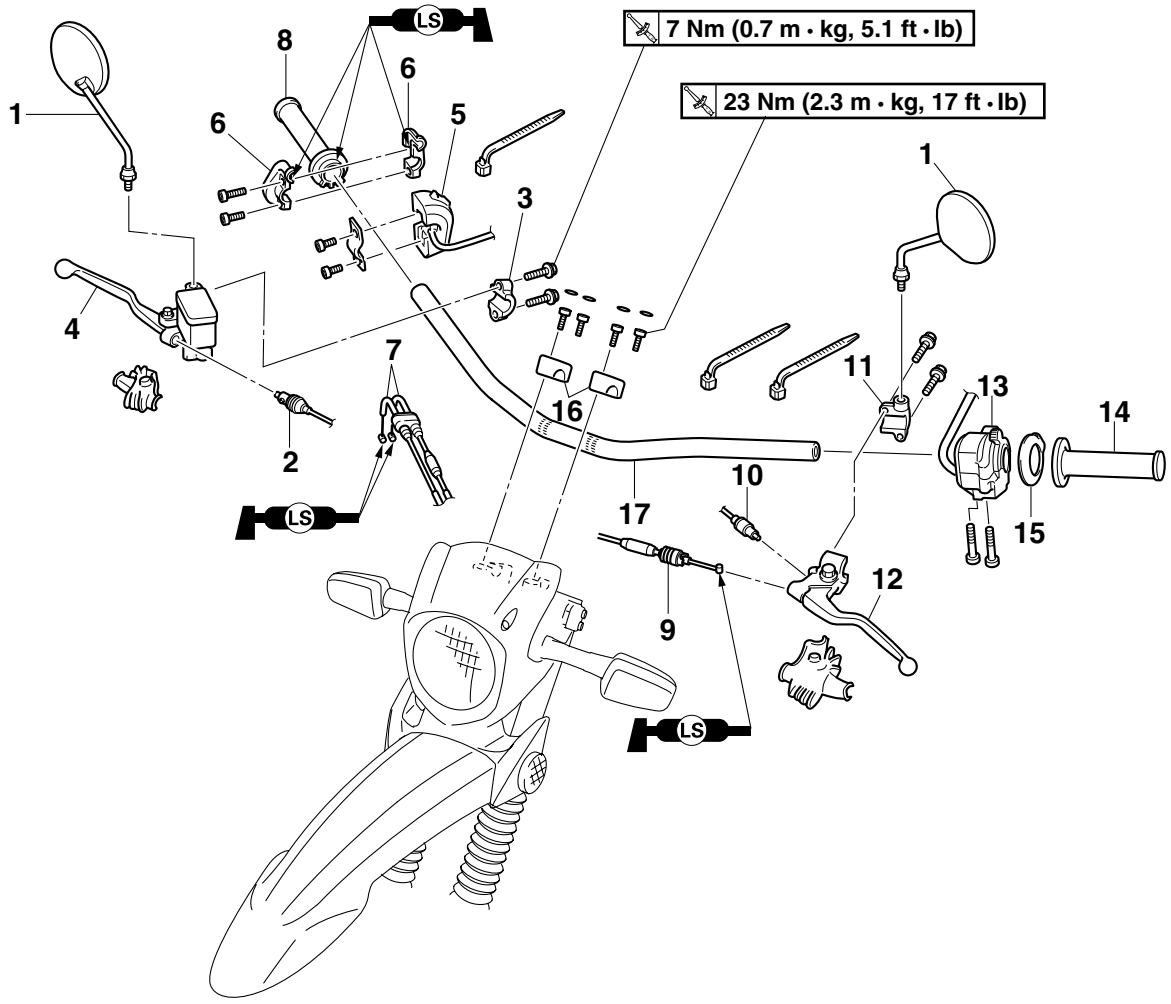
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.
4. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-17.
5. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-19.

EAS22840

HANDLEBAR

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
1	Back view mirror	2	
2	Front brake light switch	1	
3	Front brake master cylinder holder	1	
4	Front brake master cylinder assembly	1	
5	Right handlebar switch	1	
6	Throttle cable housing	1	
7	Throttle cable	2	
8	Throttle grip	1	
9	Clutch cable	1	
10	Clutch switch	1	
11	Clutch lever holder	1	
12	Clutch lever assembly	1	
13	Left handlebar switch	1	
14	Handlebar grip	1	
15	Special washer	1	
16	Handlebar holder	2	
17	Handlebar	1	
			For installation, reverse the removal procedure.

EAS22860
REMOVING THE HANDLEBARS
1. Stand the vehicle on a level surface.

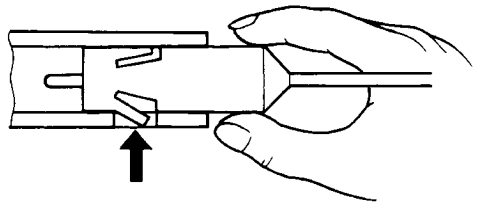
EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

2. Remove:
   - Front brake light switch
   - Clutch switch

NOTE:

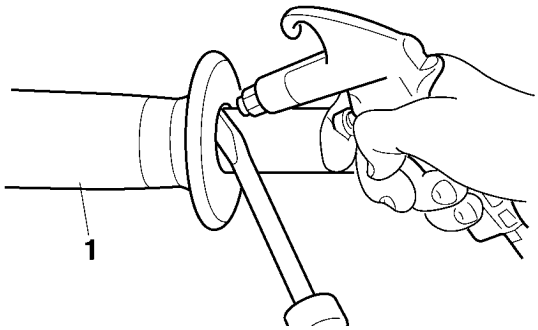
Release the key by pressing its projection, and remove the handlebar from the master cylinder assembly or clutch lever assembly.



3. Remove:
   - Handlebar grip “1”

NOTE:

Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.



EAS22880
CHECKING THE HANDLEBAR
1. Check:
   - Handlebar
     Bends/cracks/damage → Replace.

EWA13690
⚠ WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken it.

EAS22921
INSTALLING THE HANDLEBAR
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

2. Install:
   - Handlebar “1”
   - Upper handlebar holders “2”

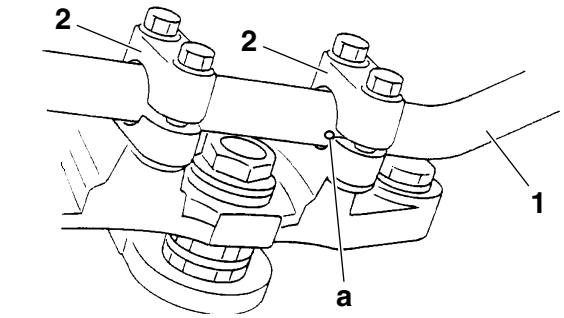
	Handlebar holder bolt 23 Nm (2.3 m•kg, 17 ft•lb)

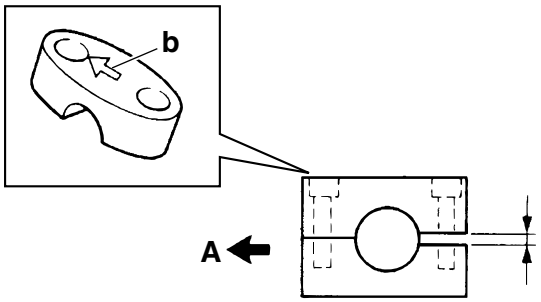
EC3C51009
CAUTION:

First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.

NOTE:

- Align mark “a” of the handlebar with the top face of upper bracket.
- The upper handlebar holders should be installed with the arrow marks “b” facing forward “A”.





3. Install:
   - Special washer
   - Handlebar grip

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a. Slightly coat the handlebar left end with a rubber adhesive.
b. Slide the handlebar grip over the left end of the handlebar.

c. Clean the excessive rubber adhesive with a clean cloth. rubber adhesive

EWA13700

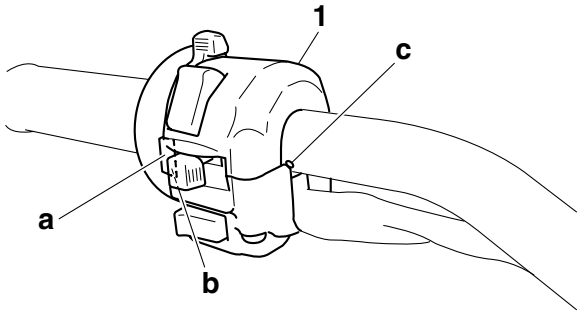
⚠ WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

1. Install:
   - Left handlebar switch "1"

NOTE:

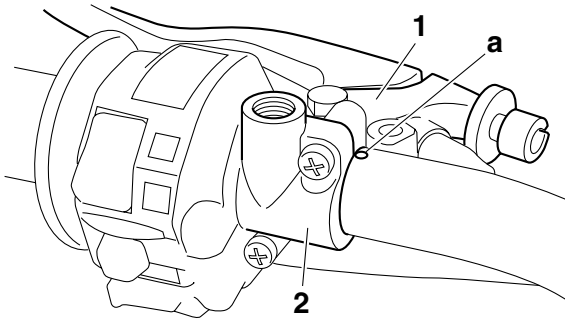
- Align tab "a" of special washer with slot "b" of left handlebar switch.
- Align the matching surface of left handlebar switch with mark "c" of the handlebar.



2. Install:
   - Clutch lever assembly "1"
   - Clutch lever holder "2"

NOTE:

Align the mating surfaces of the clutch lever holder with the punch mark "a" on the handlebar.



3. Install:
   - Throttle grip "1"
   - Throttle cables "2"
   - Throttle cable housing "3"

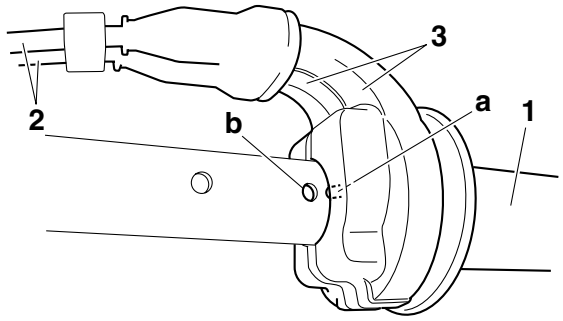
EWA13720

⚠ WARNING

Make sure the throttle grip operates smoothly.

NOTE:

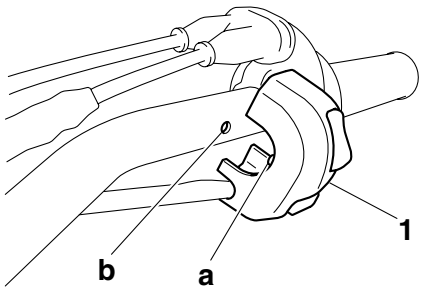
- Align projection "a" of slot cable housing with hole "b" of the handlebar.
- Slightly coat the end of slot cable and inside of throttle grip with Yamaha Grease B. Then, mount the throttle grip onto the handlebar.



4. Install:
   - Right handlebar switch "1"

NOTE:

Align projection "a" of the right handlebar switch with hole "b" of the handlebar.

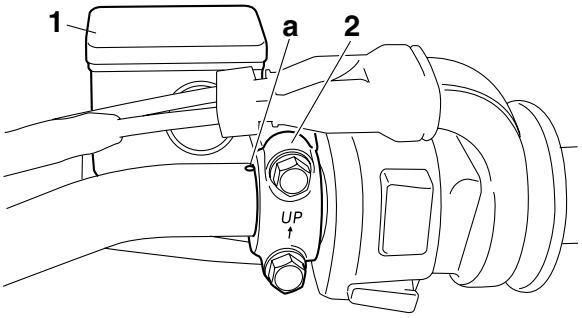


5. Install:
   - Front brake master cylinder assembly "1"
   - Front brake master cylinder holder "2"

	**Front brake master cylinder assembly** **7 Nm (0.7 m•kg, 5.1 ft•lb)**

NOTE:

- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the matching surface of brake master cylinder holder with mark "a" of handlebar.
- Tighten the upper bolt first, and then tighten the lower bolt.



6. Adjust:
   - Clutch cable free play
     Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” on page 3-12.

	Clutch lever free play **10.0–15.0 mm (0.39–0.59 in)**

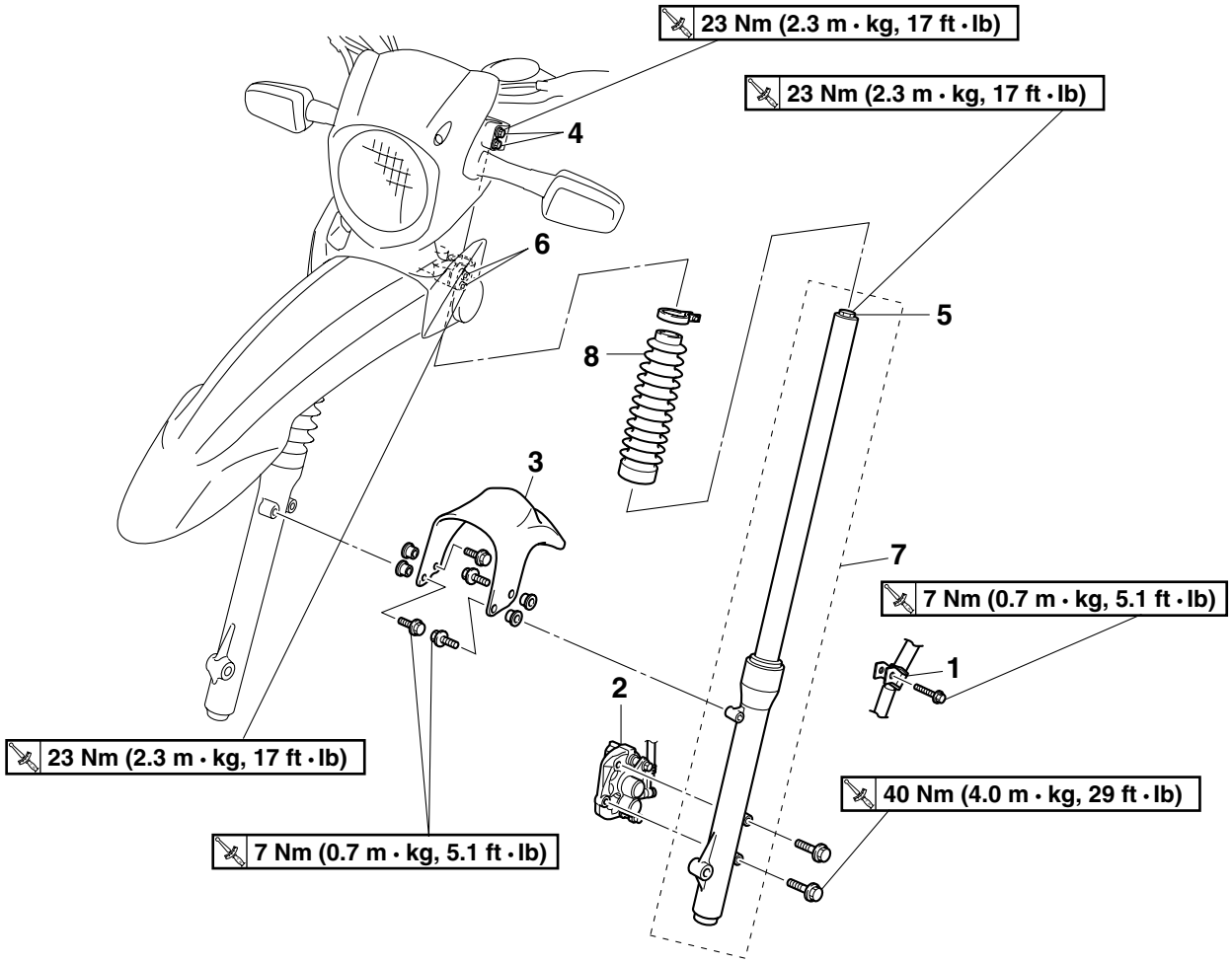
7. Adjust:
   - Throttle cable free play
     Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-7

	Throttle cable free play **3.0–5.0 mm (0.12–0.2 in)**

EAS22950

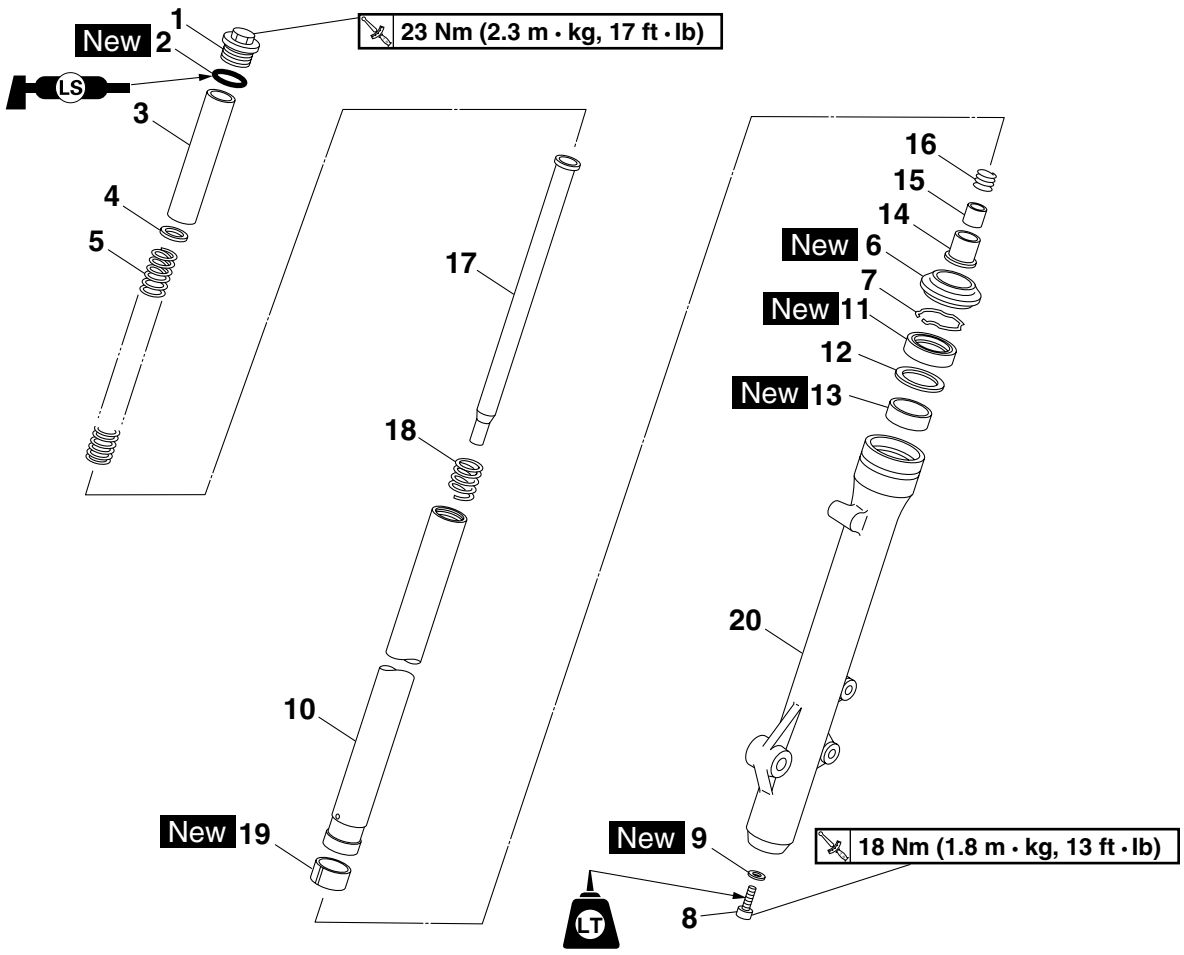
FRONT FORK

Removing the front fork legs



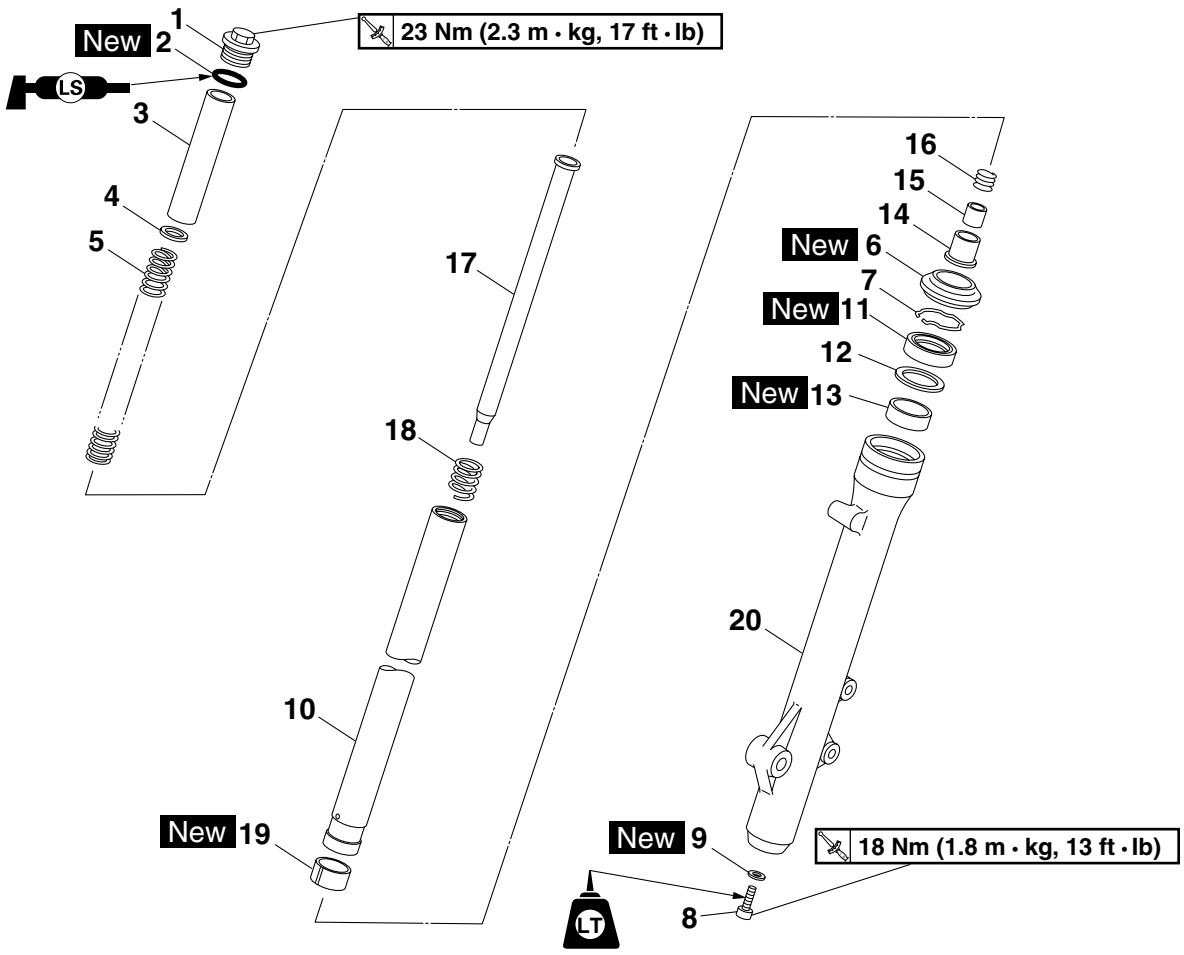
Order	Job/Parts to remove	Q'ty	Remarks
	Front wheel		Refer to "FRONT WHEEL" on page 4-2.
1	Brake hose holder	1	
2	Front brake caliper	1	
3	Mudguard	1	
4	Upper bracket pinch bolt	2	Loosen.
5	Front fork cap bolt	1	Loosen.
6	Lower bracket pinch bolt	2	Loosen.
7	Fork leg	1	
8	Dust boot	1	
			For installation, reverse the removal procedure.

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
1	Front fork cap bolt	1	
2	Cap bolt O-ring	1	
3	Spacer	1	
4	Spring seat	1	
5	Fork spring	1	
6	Dust seal	1	
7	Oil seal clip	1	
8	Damper rod bolt	1	
9	Copper washer	1	
10	Inner tube	1	
11	Oil seal	1	
12	Washer	1	
13	Outer tube bushing	1	
14	Oil flow stopper	1	
15	Spacer	1	
16	Spring	1	
17	Damper rod	1	
18	Rebound spring	1	
19	Inner tube bushing	1	
20	Outer tube	1	

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			For assembly, reverse the disassembly procedure.

EAS22970
REMOVING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

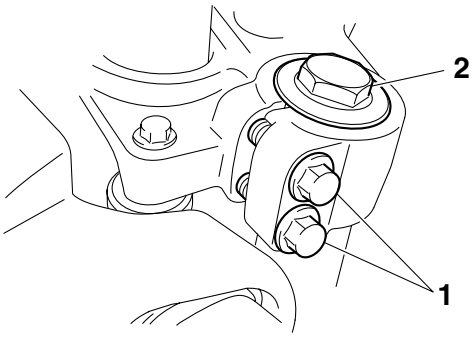
Securely support the vehicle so that there is no danger of it falling over.

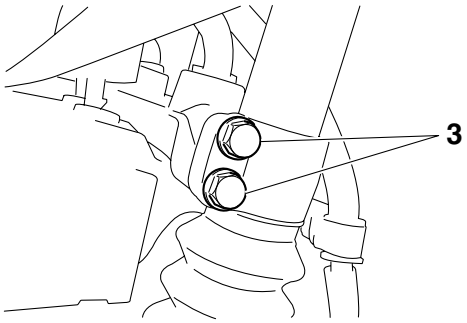
NOTE:
Place the vehicle on a suitable stand so that the front wheel is elevated.

2. Loosen:
   - Upper bracket pinch bolt “1”
   - Front fork cap bolt “2”
   - Lower bracket pinch bolts “3”

EWA13640
⚠ WARNING

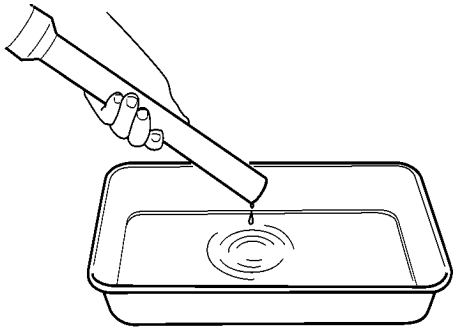
Before loosening the upper and lower bracket pinch bolts, support the front fork leg.





EAS22980
DISASSEMBLING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Drain:
   - Fork oil

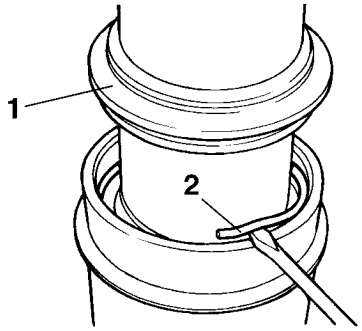
NOTE:
Stroke the outer tube several times while draining the fork oil.



2. Remove:
   - Dust seal “1”
   - Oil seal clip “2”
     (with a flat-head screwdriver)

ECA14180
CAUTION:

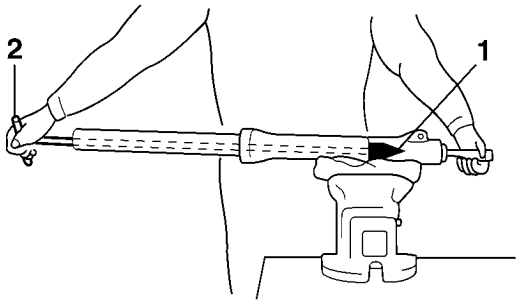
Do not scratch the inner tube.



3. Remove:
   - Damper rod assembly bolt
   - Copper washer

NOTE:
While holding the damper rod assembly with the damper rod holder “1” and T-handle “2”, loosen the damper rod bolt.

	**Damper rod holder** **90890-01460**



4. Remove:
   • Inner tube

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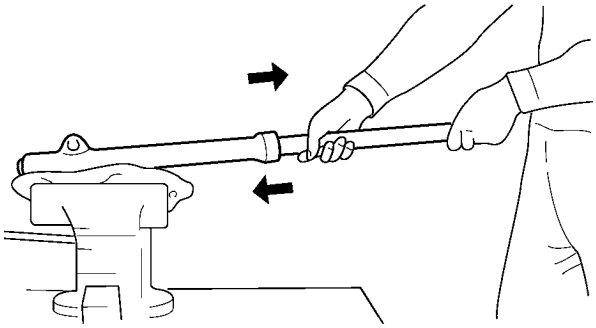
a. Hold the front fork leg horizontally.
b. Securely clamp the brake caliper bracket in a vise with soft jaws.
c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

ECA14190

CAUTION:

• Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.
• Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.



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EAS23010

CHECKING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Check:
   • Inner tube
   • Outer tube
   Bends/damage/scratches → Replace.

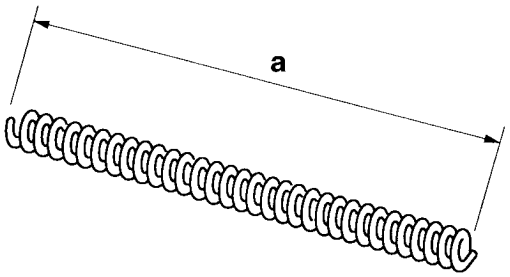
EWA13650

WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:
   • Spring free length “a”
   Out of specification → Replace.

Fork spring free length
482.0 mm (18.98 in)
Limit
472.3 mm (18.59 in)



3. Check:
   • Damper rod
   Damage/wear → Replace.
   Obstruction → Blow out all of the oil passages with compressed air.
   • Oil flow stopper
   Damage → Replace.

ECA14200

CAUTION:

• The front fork leg has a built-in damper adjusting rod and a very sophisticated internal construction, which are particularly sensitive to foreign material.
• When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.

4. Check:
   • Cap bolt
   Damage/wear → Replace.

EAS23020

ASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

EWA13660

WARNING

• Make sure the oil levels in both front fork legs are equal.
• Uneven oil levels can result in poor handling and a loss of stability.

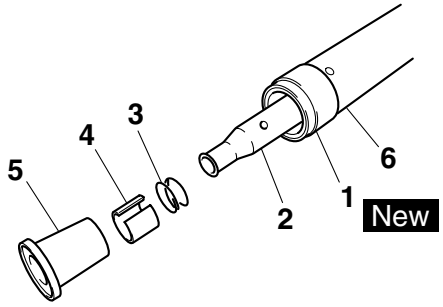
NOTE:
- When assembling the front fork leg, be sure to replace the following parts:
  - Inner tube bushing
  - Outer tube bushing
  - Oil seal
  - Dust seal
- Before assembling the front fork leg, make sure all of the components are clean.

1. Install:
   - Inner tube bushing "1" New
   - Damper rod "2"
   - Rebound spring
   - Spring "3"
   - Spacer "4"
   - Oil flow stopper "5"

EC3C51002

CAUTION:

Allow the damper rod assembly to slide slowly down the inner tube "6" until it appears from the bottom of the inner tube. Be careful not to damage the inner tube.



2. Lubricate:
   - Inner tube's outer surface

Recommended oil
Yamaha fork oil 15WT

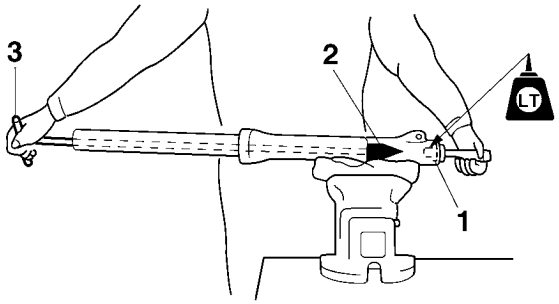
3. Tighten:
   - Damper rod bolt "1"

Damper rod bolt
18 Nm (1.8 m•kg, 13 ft•lb)
LOCTITE®204
Apply locking agent (LOCTITE®)

NOTE:

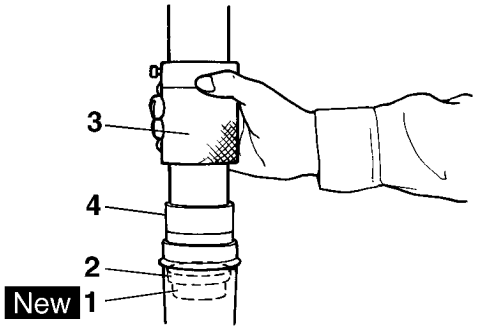
While holding the damper rod assembly with the damper rod holder "2" and T-handle "3", tighten the damper rod assembly bolt.

Damper rod holder
90890-01460
T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326



4. Install:
   - Outer tube bushing "1" New
   - Washer "2"
     (with the fork seal driver weight "3" and fork seal driver attachment "4")

Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø35)
90890-01369
Replacement 35 mm
YM-A9409-5



5. Install:
   - Oil seal "1" New
     (with the fork seal driver weight "2" and fork seal driver attachment "3")

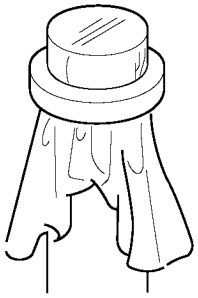
ECA14220

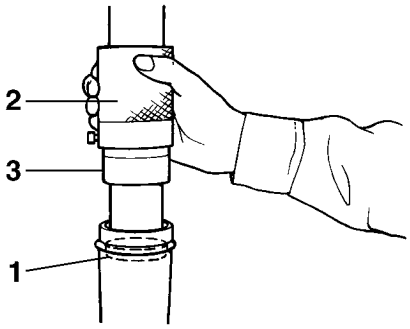
CAUTION:

Make sure the numbered side of the oil seal faces up.

NOTE:
- Before installing the oil seal, lubricate its lips with lithium soap base grease.

- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.

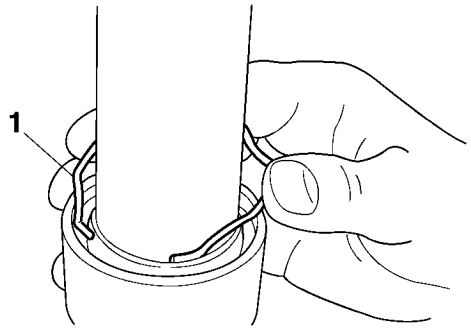




6. Install:
   - Oil seal clip "1"

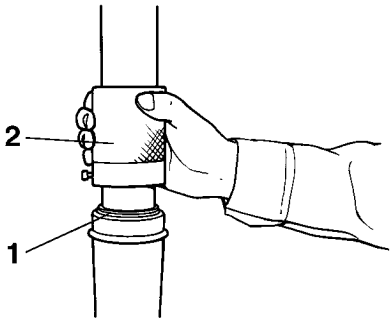
NOTE:

Adjust the oil seal clip so that it fits into the outer tube's groove.



7. Install:
   - Dust seal "1"
     (with the fork seal driver weight "2")

	Fork seal driver weight **90890-01367** **Replacement hammer** **YM-A9409-7**



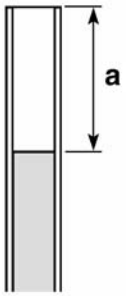
8. Fill:
   - Front fork leg
     (with the specified amount of the recommended fork oil)

	Quantity **385.0 cm^3 (13.02 US oz) (13.58 Imp.oz)** **Recommended oil** **Yamaha fork oil 15WT**

	Level **125.0 mm (4.92 in)** **At position "a" from the inner tube top end when the inner tube is fully compressed in the outer tube**

NOTE:

- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.



9. Install:
   - Fork spring
   - Spring seat
   - Spacer
   - Front fork cap bolt

NOTE:

- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.

EAS23050

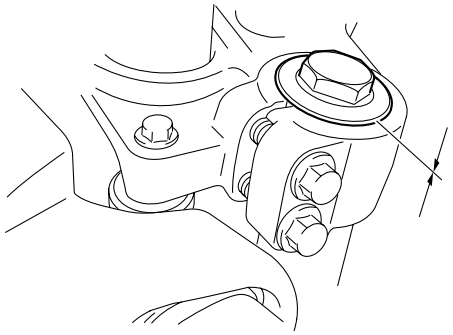
INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

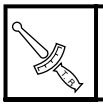
1. Install:
   - Dust boot
   - Clamp screw
     (temporarily)
2. Install:
   - Front fork leg
     Temporarily tighten the upper and lower bracket pinch bolts.

NOTE:

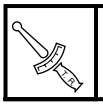
The inner tube top face must match the upper bracket top face.



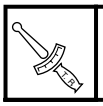
3. Tighten:
   - Lower bracket pinch bolt “1”

	**Lower bracket pinch bolt** **23 Nm (2.3 m•kg, 17 ft•lb)**

   - Front fork cap bolt “2”

	**Front fork cap bolt** **23 Nm (2.3 m•kg, 17 ft•lb)**

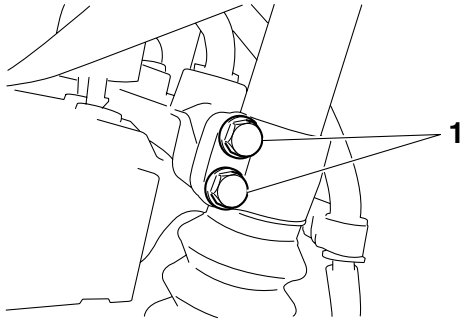
   - Upper bracket pinch bolt “3”

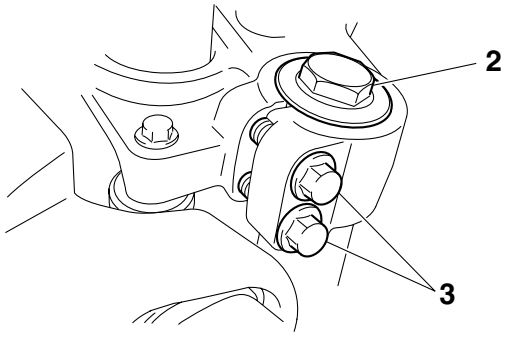
	**Upper bracket pinch bolt** **23 Nm (2.3 m•kg, 17 ft•lb)**

EWA13680

⚠ WARNING

Make sure the brake hoses are routed properly.

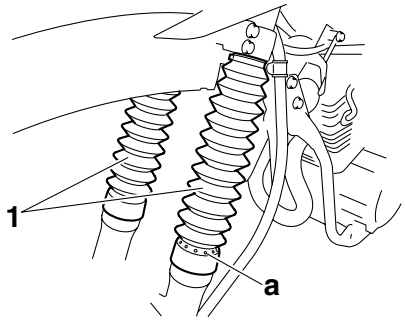




4. Install:
   - Dust boots “1”
   - Clamp screw

NOTE:

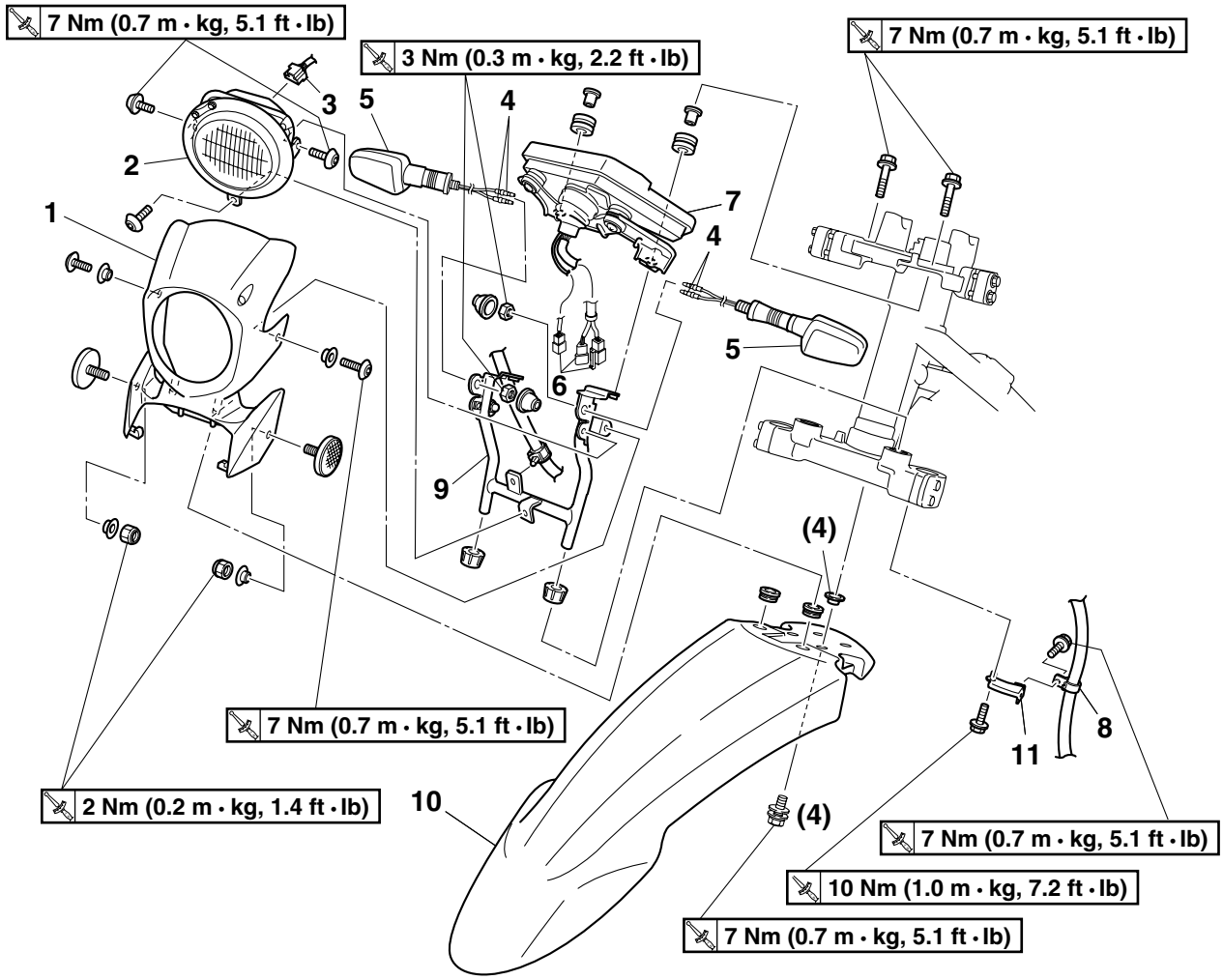
Direct air-bleeding hole “a” of the dust boot outward of the vehicle, and press and assemble the dust boot top end to the lower bracket.



EAS23090

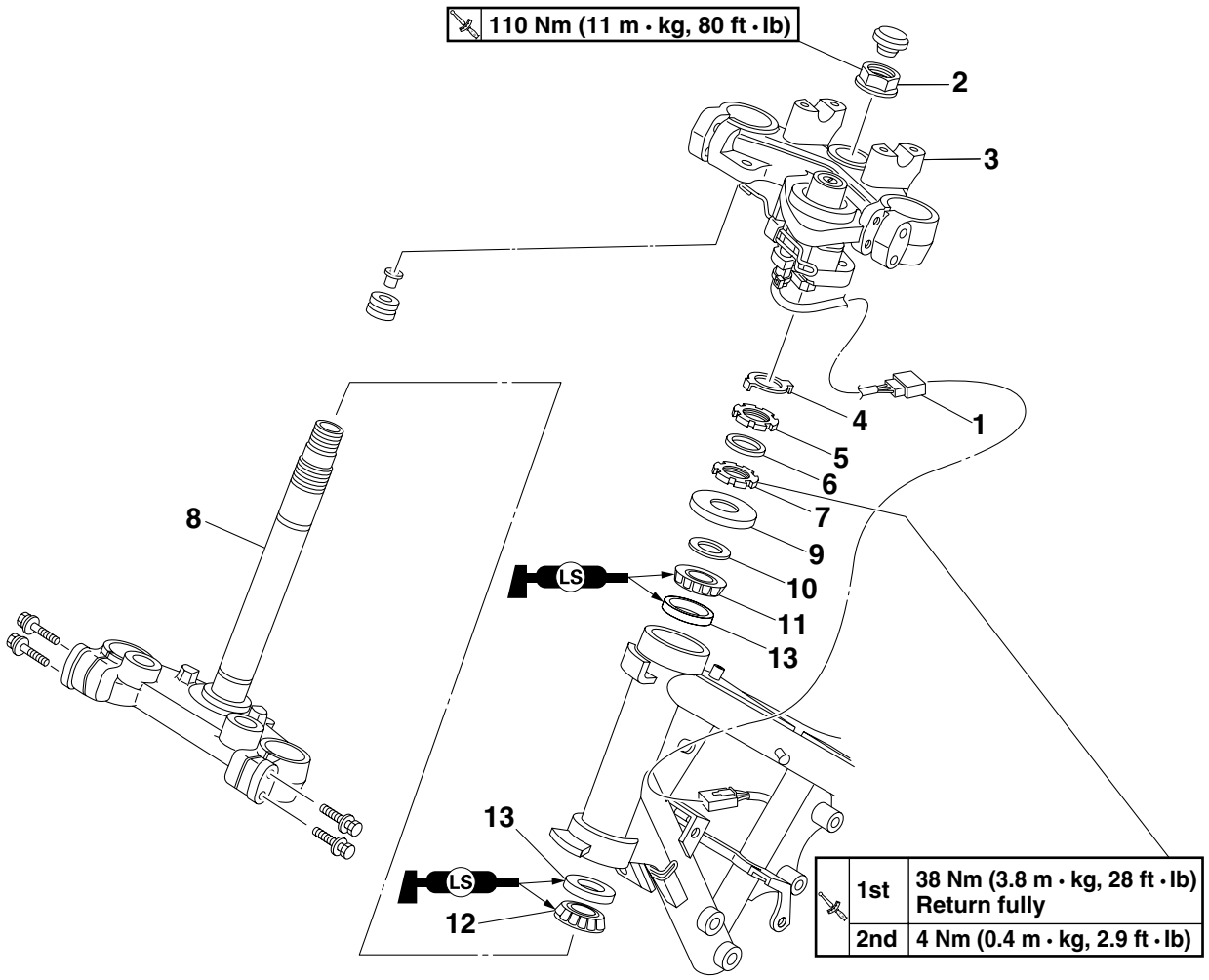
STEERING HEAD

Removing the head light unit, meter assembly and front fender



Order	Job/Parts to remove	Q'ty	Remarks
	Tool box		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Handlebar		Refer to "HANDLEBAR" on page 4-35.
	Fork leg		Refer to "FRONT FORK" on page 4-39.
1	Head light cowling	1	
2	Headlight unit	1	
3	Headlight coupler	1	Disconnect.
4	Turn signal light connector	2	Disconnect.
5	Front turn signal light/rear turn signal light	1/1	
6	Meter assembly coupler	3	Disconnect.
7	Meter assembly	1	
8	Brake hose holder	1	
9	Head light unit stay	1	
10	Front fender	1	
11	Brake hose holder bracket	1	
			For installation, reverse the removal procedure.

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Headlight unit/meter assembly/front fender		Refer to "STEERING HEAD" on page 4-47.
1	Main switch coupler	1	
2	Steering stem nut	1	
3	Upper bracket	1	
4	Lock washer	1	
5	Upper ring nut	1	
6	Rubber washer	1	
7	Lower ring nut	1	
8	Lower bracket	1	
9	Bearing cover	1	
10	Washer	1	
11	Upper bearing	1	
12	Lower bearing	1	
13	Bearing races	2	
			For installation, reverse the removal procedure.

EAS23110
REMOVING THE LOWER BRACKET
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

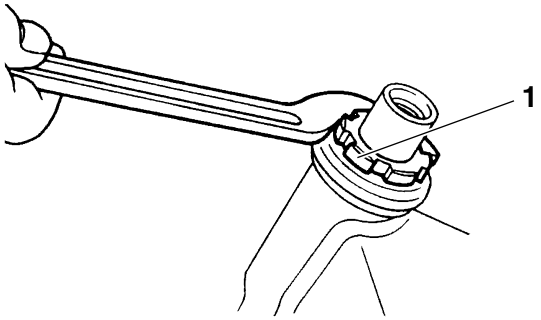
2. Remove:
   - Upper ring nut
   - Rubber washer
   - Lower ring nut “1”

NOTE:
Remove both upper and lower ring nuts using the ring nut wrench.

Ring nut wrench
90890-01268
Spanner wrench
YU-01268

EWA13730
⚠ WARNING

Securely support the lower bracket so that there is no danger of it falling.



EAS23120
CHECKING THE STEERING HEAD
1. Wash:
   - Bearings
   - Bearing races

Recommended cleaning solvent
Kerosene

2. Check:
   - Bearings
   - Bearing races
     Damage/pitting → Replace.
3. Replace:
   - Bearings
   - Bearing races

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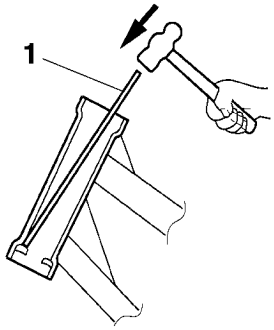
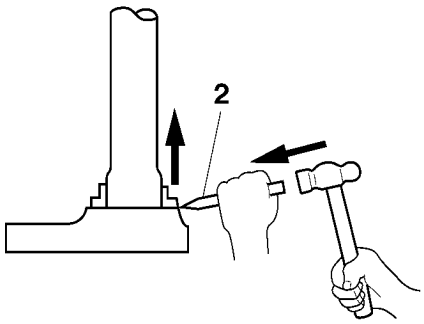
a. Remove the bearing races from the steering head pipe with a long rod “1” and hammer.
b. Remove the bearing from the lower bracket with a floor chisel “2” and hammer.
c. Install new bearing races.

ECA14270
CAUTION:

If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE:
Always replace the bearings and bearing races as a set.





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4. Check:
   - Upper bracket
   - Lower bracket
     (along with the steering stem)
     Bends/cracks/damage → Replace.

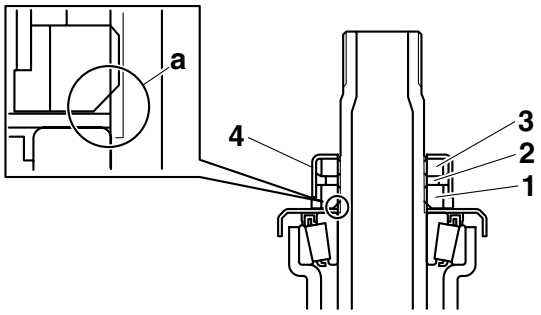
EAS23140
INSTALLING THE STEERING HEAD
1. Lubricate:
   - Upper bearing
   - Lower bearing
   - Bearing races

Recommended lubricant
Lithium-soap-based grease

2. Install:
   - Lower bracket
   - Lower ring nut “1”
   - Rubber washer “2”

- Upper ring nut “3”
- Lock washer “4”
  Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-21.

NOTE:
Portion “a” having the large tapered area must face downward when the lower ring nut is mounted.



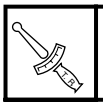
3. Install:
   - Upper bracket
   - Steering stem nut

NOTE:
Temporarily tighten the steering stem nut.

4. Install:
   - Front fork legs
     Refer to “FRONT FORK” on page 4-39.

NOTE:
Temporarily tighten the lower bracket pinch bolts.

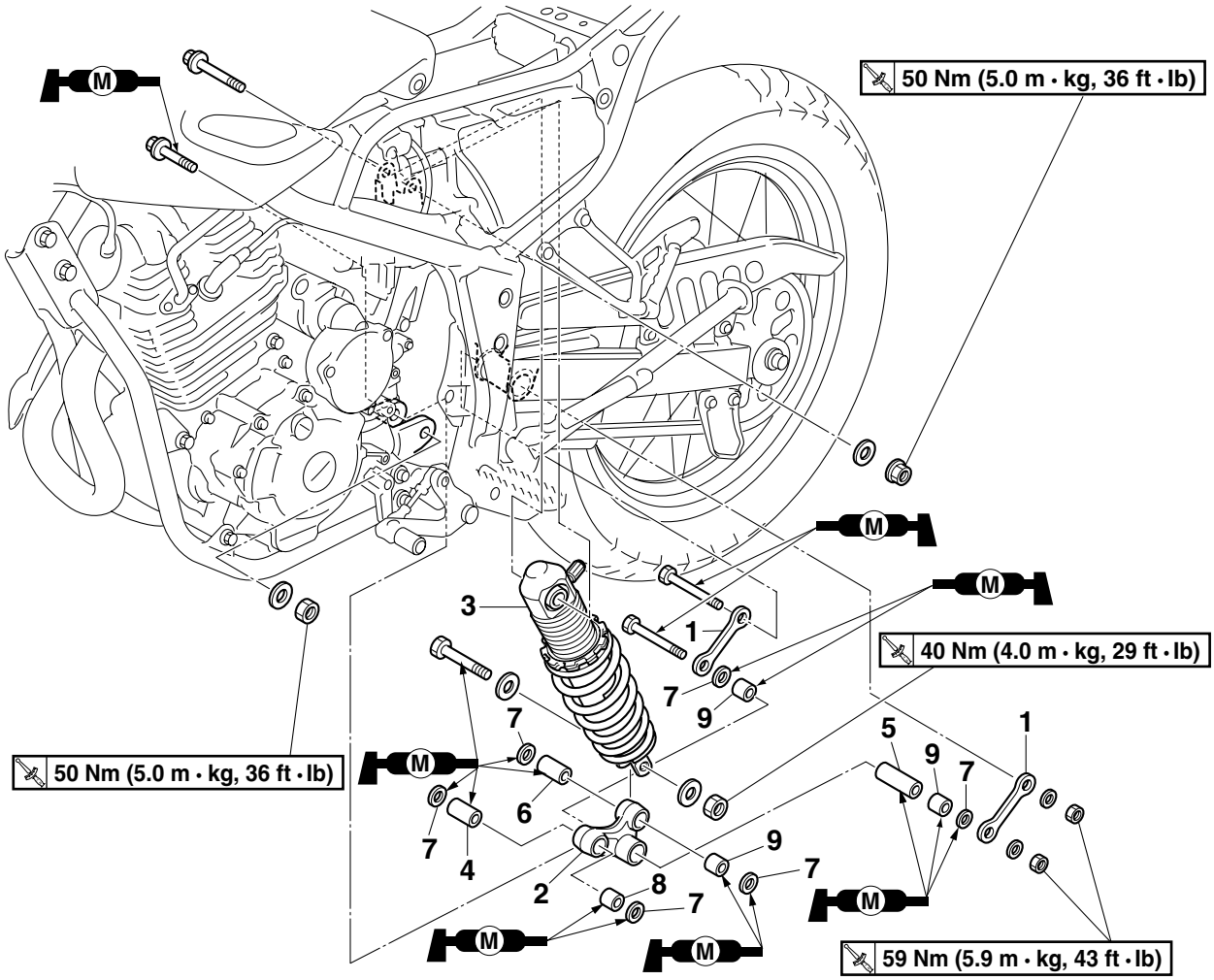
5. Tighten:
   - Steering stem nut

	**Steering stem nut** **110 Nm (11.0 m•kg, 80 ft•lb)**

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Rear left side cover/rear right side cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Connecting arm	2	
2	Relay arm	1	
3	Rear shock absorber assembly	1	
4	Spacer	1	
5	Spacer	1	
6	Spacer	1	
7	Oil seal	6	
8	Bearing	1	
9	Bushing	3	
			For installation, reverse the removal procedure.

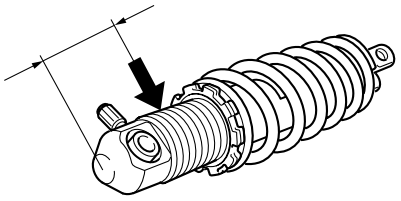
EAS23180
HANDLING THE REAR SHOCK ABSORBER
EWA13740
⚠ WARNING

This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber.
- **Do not tamper or attempt to open the rear shock absorber.**
- **Do not subject the rear shock absorber to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.**
- **Do not deform or damage the rear shock absorber in any way. Rear shock absorber damage will result in poor damping performance.**

EAS23190
DISPOSING OF A REAR SHOCK ABSORBER
1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3-mm hole through the rear shock absorber at a point 60 mm from its end as shown.

EWA13760
⚠ WARNING

Wear eye protection to prevent eye damage from released gas or metal chips.



EAS23230
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

EAS23240
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY
1. Check:
   - Rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - Rear shock absorber
     Gas leaks/oil leaks → Replace the rear shock absorber assembly.
   - Spring
     Damage/wear → Replace the rear shock absorber assembly.
   - Bushings
     Damage/wear → Replace.
   - Bolts
     Bends/damage/wear → Replace.

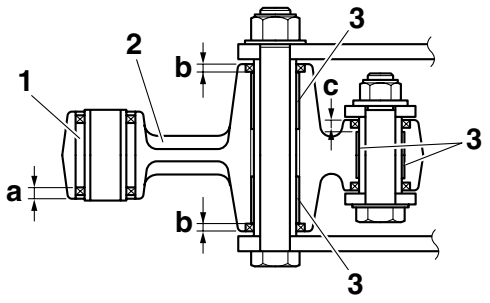
EAS23260
CHECKING THE CONNECTING ARM AND RELAY ARM
1. Check:
   - Connecting arms
   - Relay arm
     Damage/wear → Replace.
2. Check:
   - Bearings
   - Oil seals
   - Bushing
     Damage/pitting → Replace.
3. Check:
   - Spacers
     Damage/scratches → Replace.

EAS23270
INSTALLING THE RELAY ARM
1. Lubricate:
   - Spacers
   - Bearings
   - Oil seal

	Recommended lubricant **Lithium soap base grease**

2. Install:
   - Bearing “1”
     (to the relay arm “2”)
   - Bushing “3”
     to relay arm “2”

Installed depth "a"
4.5 mm
Installed depth "b"
3 mm
Installed depth "c"
4 mm



EAS23310
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Install:
   - Rear shock absorber assembly

NOTE:
Install the rear shock absorber by facing its valve backward.

2. Tighten:
   - Rear shock absorber assembly upper nut

Rear shock absorber assembly upper nut
50 Nm (5.0 m•kg, 36 ft•lb)

- Relay arm nut (frame side)

Relay-arm nut (frame side)
50 Nm (5.0 m•kg, 36 ft•lb)

- Rear shock absorber assembly lower nut

Rear shock absorber assembly lower nut
40 Nm (4.0 m•kg, 29 ft•lb)

- Connecting arm nut (relay-arm side)

Connecting arm nut (relay-arm side)
59 Nm (5.9 m•kg, 43 ft•lb)

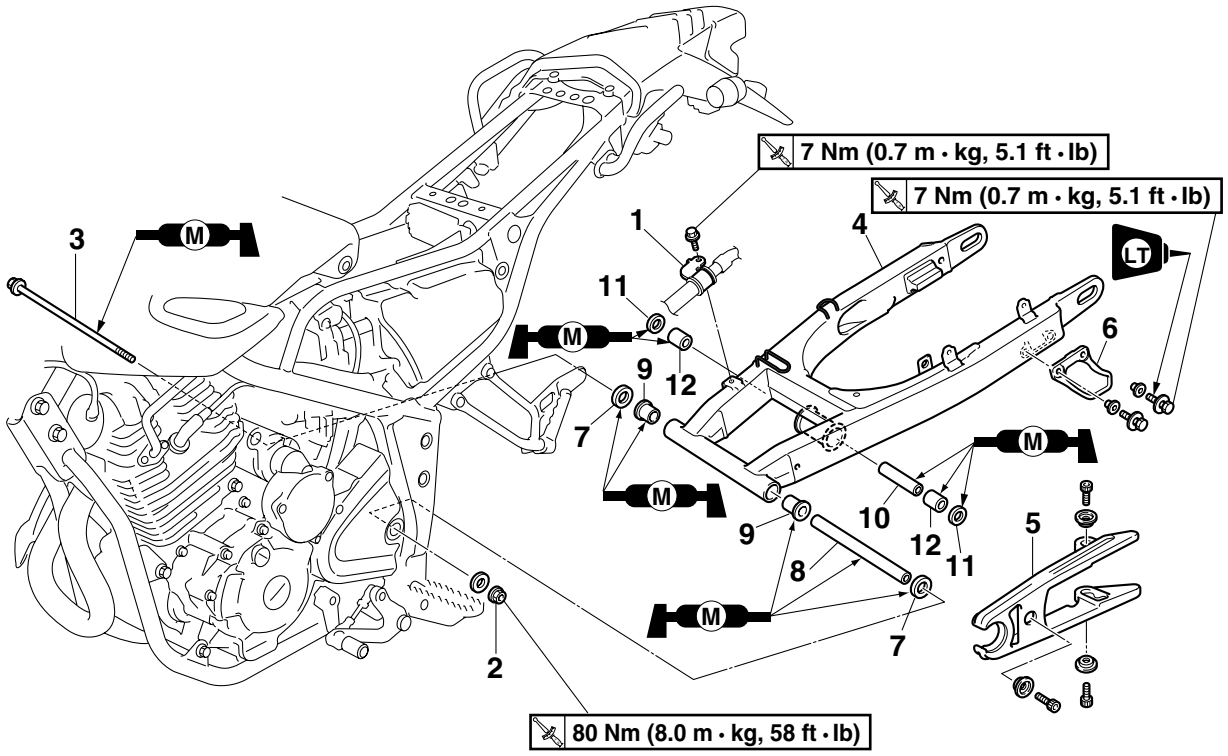
- Connecting arm nut (swingarm side)

Connecting arm nut (swingarm side)
59 Nm (5.9 m•kg, 43 ft•lb)

EAS23330

SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-8.
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-51.
1	Brake hose holder	1	
2	Pivot shaft nut	1	
3	Pivot shaft	1	
4	Swingarm	1	
5	Front drive chain guide	1	
6	Rear drive chain guide	1	
7	Dust cover	2	
8	Spacer	1	
9	Bushing	2	
10	Spacer	1	
11	Oil seal	2	
12	Bushing	2	
			For installation, reverse the removal procedure.

EAS23350
REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Measure:
   - Swingarm side play
   - Swingarm vertical movement

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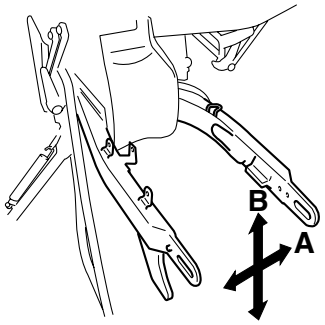
a. Measure the tightening torque of the pivot shaft nut.

	**Pivot shaft nut** **80 Nm (8.0 m•kg, 58 ft•lb)**

b. Measure the swingarm side play “A” by moving the swingarm from side to side.
c. If the swingarm side play is out of specification, check the spacers, bearings, washers, and dust covers.

	**Swingarm up/down stroke limit at rear end position of the rear arm** **1.0 mm** **Swing arm play limit on the pivot shaft** **1.0 mm**

d. Check the swingarm vertical movement “B” by moving the swingarm up and down.
If swingarm vertical movement is not smooth or if there is binding, check the spacers, spacers, washers, and dust covers.



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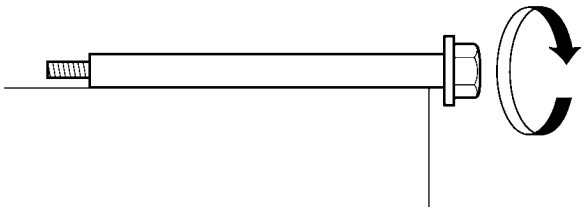
EAS23360
CHECKING THE SWINGARM

1. Check:
   - Swingarm
     Bends/cracks/damage → Replace.
2. Check:
   - Pivot shaft
     Roll the pivot shaft on a flat surface.
     Bends → Replace.

EWA13770
⚠ WARNING

Do not attempt to straighten a bent pivot shaft.



3. Wash:
   - Pivot shaft
   - Dust covers
   - Spacer
   - Washers
   - Bushing

	**Recommended cleaning solvent** **Kerosene**

4. Check:
   - Dust covers
   - Spacer
   - Washers
   - Oil seals
     Damage/wear → Replace.
   - Bushing
     Damage/pitting → Replace.

EAS23380
INSTALLING THE SWINGARM

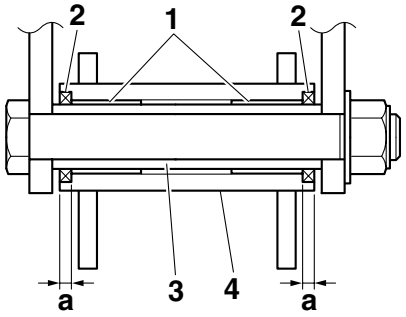
1. Lubricate:
   - Bushing
   - Spacers
   - Dust covers
   - Pivot shaft

	**Recommended lubricant** **Molybdenum disulfide grease**

2. Install:
   - Bushing “1”

- Oil seal “2”
- Spacer “3”
  (to the swingarm “4”)

	Installed depth “a” **3 mm**



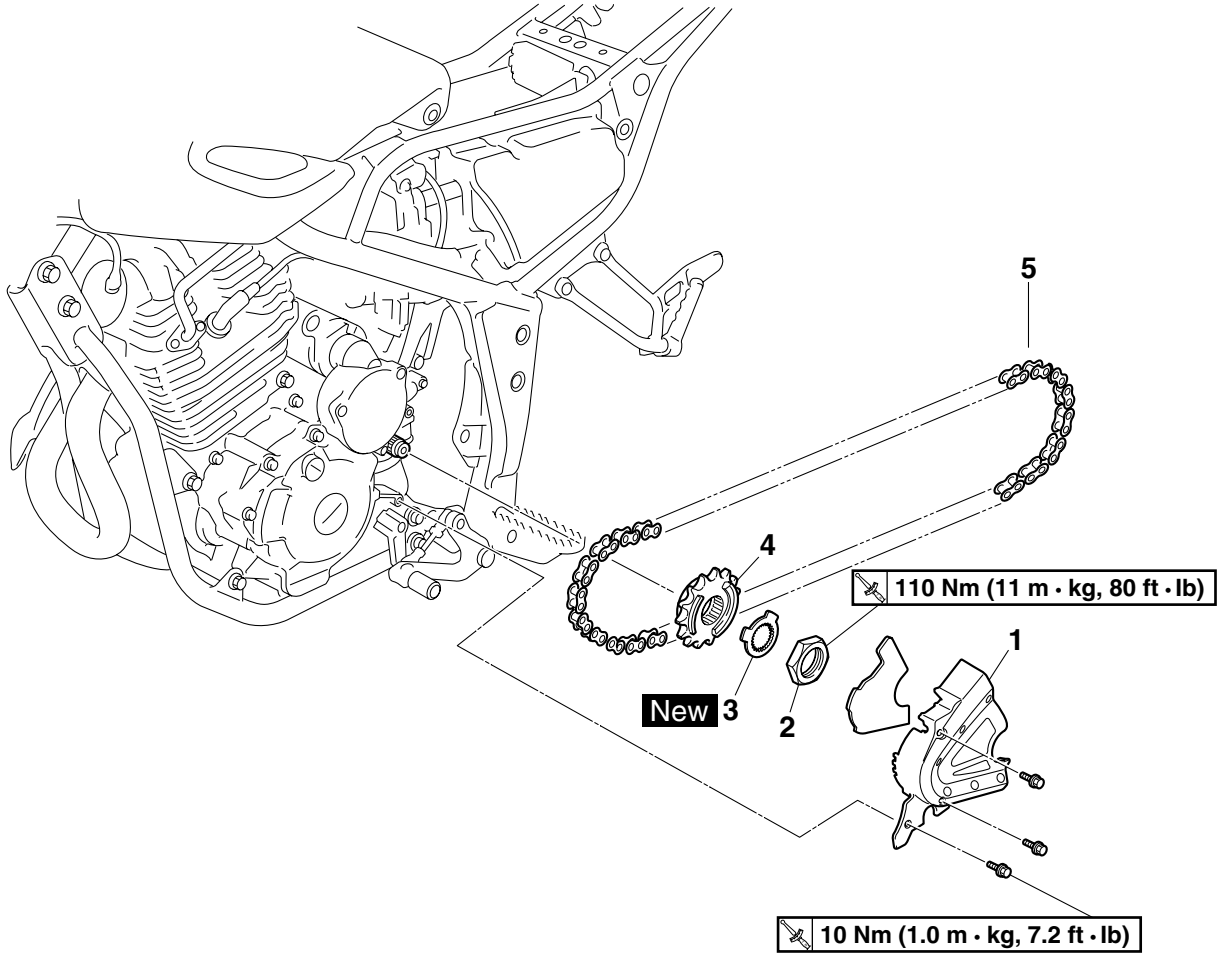
3. Install:
   - Rear shock absorber assembly
   - Rear wheel
     Refer to “REAR SHOCK ABSORBER ASSEMBLY” on page 4-51 and “REAR WHEEL” on page 4-8.
4. Adjust:
   - Drive chain slack
     Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-20.

	Drive chain slack **40.0–45.0 mm (1.57–1.77 in)**

EAS23400

CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Swingarm		Refer to "SWINGARM" on page 4-54.
1	Drive sprocket cover	1	
2	Drive sprocket nut	1	
3	Lock washer	1	
4	Drive sprocket	1	
5	Drive chain	1	
			For installation, reverse the removal procedure.

EAS23420
REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface.

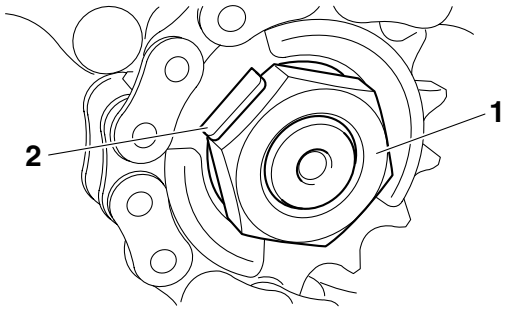
EWA13120
⚠ WARNING

Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - Drive sprocket nut “1”
   - Lock washer “2”

NOTE:
- Straighten the lock washer tab.
- Operate the rear brake, and loosen the drive sprocket.
- After loosening the drive sprocket, remove the rear wheel and swingarm.



3. Remove:
   - Swingarm
   Refer to “SWINGARM” on page 4-54.

EAS23441
CHECKING THE DRIVE CHAIN

1. Measure:
   - 15-link section “a” of the drive chain
   Out of specification → Replace the drive chain.

	15-link length limit **191.5 mm (7.54 in)**

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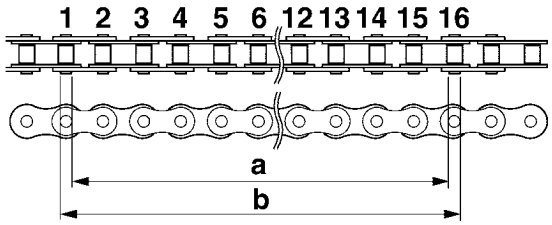
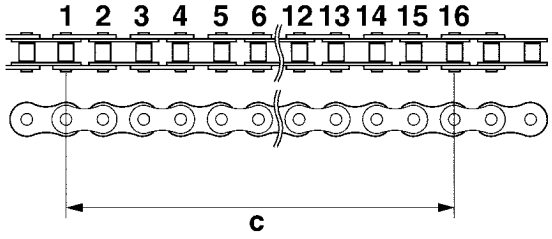
a. Measure the length “a” between the inner sides of the pins and the length “b” between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.



b. Calculate the length “c” of the 15-link section, push down on the drive chain to increase its tension.
Drive chain 15-link section length “c” = (length “a” between pin inner sides + length “b” between pin outer sides)/2



NOTE:
- When measuring a 15-link section of the drive chain, make sure that the drive chain is taut.
- Perform this procedure 2–3 times, at a different location each time.

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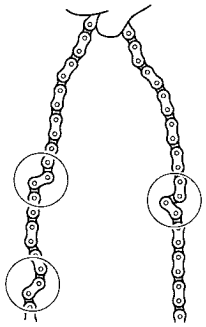
2. Check:
   - Drive chain
   Stiffness → Clean, lubricate, or replace.



3. Clean:
   - Drive chain

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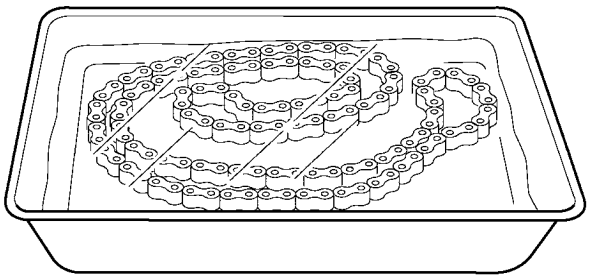
a. Wipe the drive chain with a clean cloth.

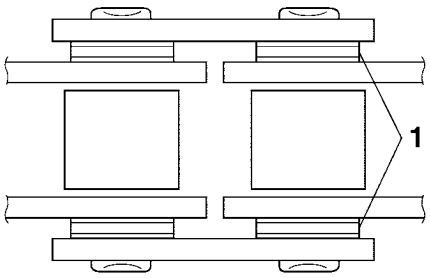
b. Put the drive chain in kerosene and remove any remaining dirt.
c. Remove the drive chain from the kerosene and completely dry it.

EC3C51003

CAUTION:

This vehicle has a drive chain with small rubber O-rings "1" between the drive chain side plates. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings.





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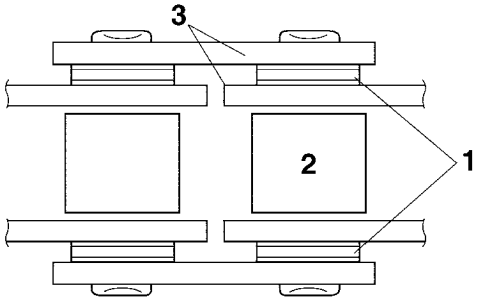
4. Check:
   - O-rings "1"
     Damage → Replace the drive chain.
   - Drive chain rollers "2"
     Damage/wear → Replace the drive chain.
   - Drive chain side plates "3"
     Damage/wear → Replace the drive chain.
     Cracks → Replace the drive chain.



5. Lubricate:
   - Drive chain

	Recommended lubricant **Engine oil or chain lubricant suitable for O-ring chains**

EAS23460

CHECKING THE DRIVE SPROCKET

1. Check:
   - Drive sprocket
     Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-10.

EAS23490

INSTALLING THE DRIVE CHAIN

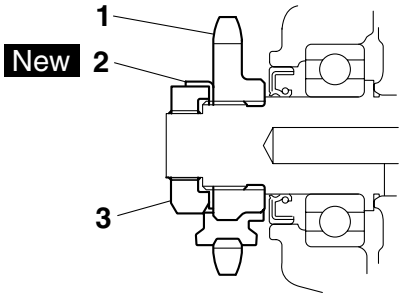
1. Lubricate:
   - Drive chain

	Recommended lubricant **Engine oil or chain lubricant suitable for O-ring chains**

2. Install:
   - Drive chain
   - Drive sprocket "1"
   - Lock washer "2" New
   - Drive sprocket nut "3"
     (temporarily)

NOTE:

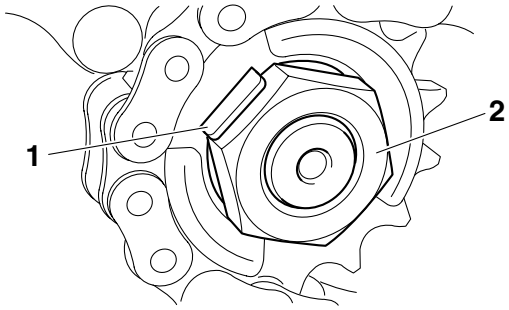
While applying the drive sprocket, tighten the drive sprocket nut.



3. Install:
   - Swingarm
     Refer to "SWINGARM" on page 4-54.
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-8.
4. Install:
   - Lock washer "1"
   - Drive sprocket "2"

	Drive sprocket nut **110 Nm (11.0 m•kg, 80 ft•lb)**

NOTE:
- Tighten the drive sprocket nut by applying the rear drive.
- Be sure to bend the lock washer tab along to the nut side face.



5. Adjust:
   - Drive chain slack
     Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-20

	Drive chain slack **40.0–45.0 mm (1.57–1.77 in)**

ECA13550

CAUTION:

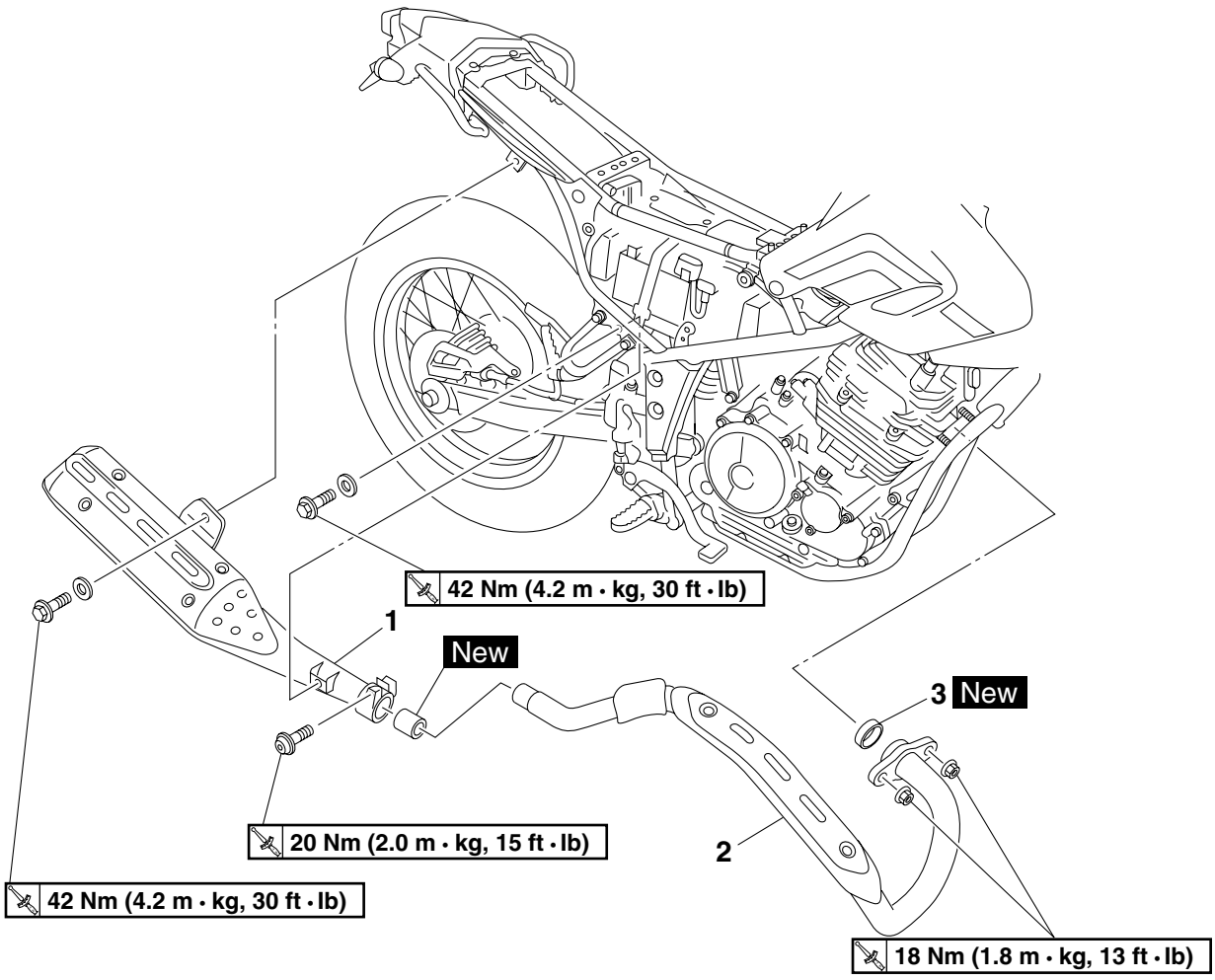
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

ENGINE

EAS23710

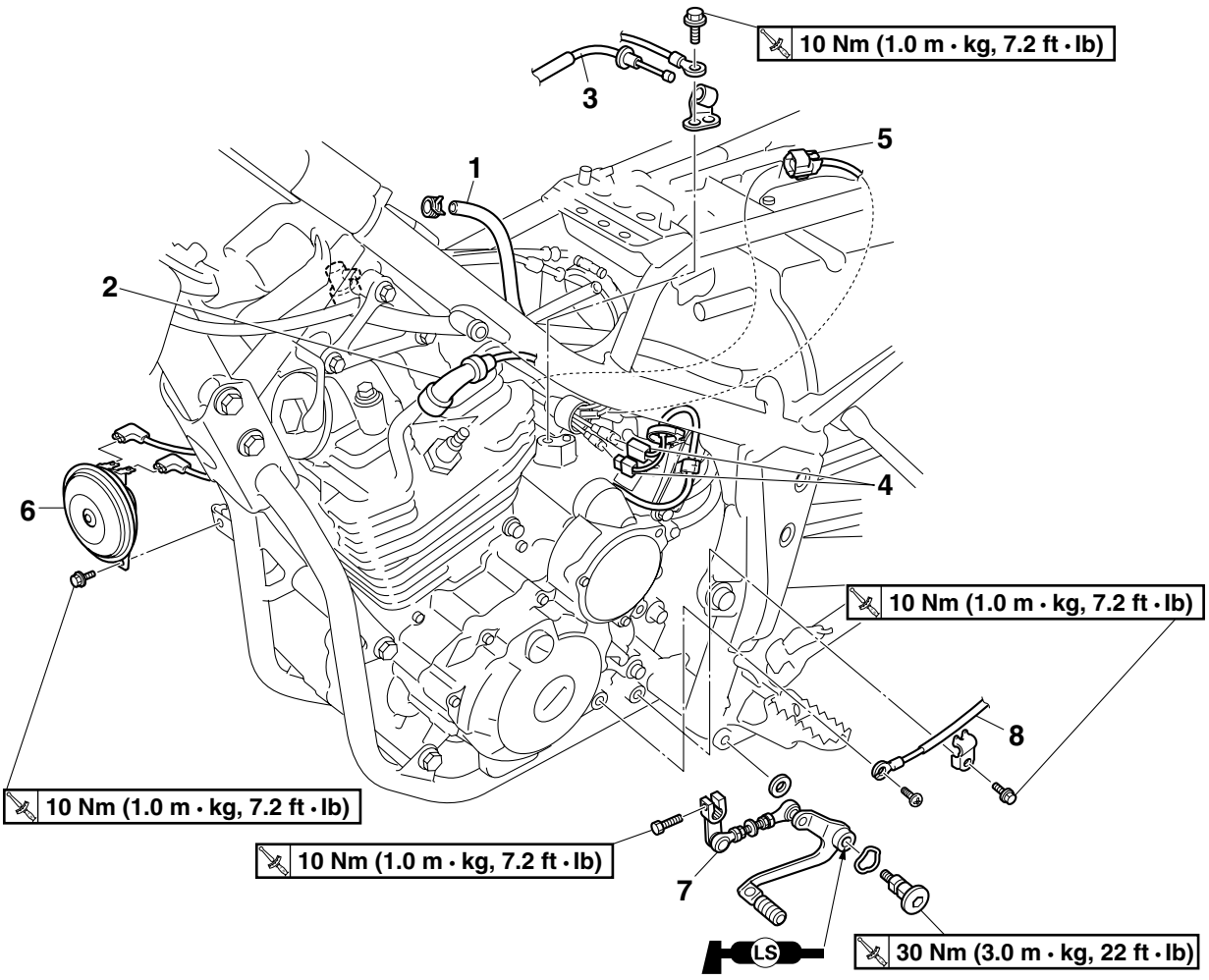
ENGINE REMOVAL

Removing the exhaust pipe



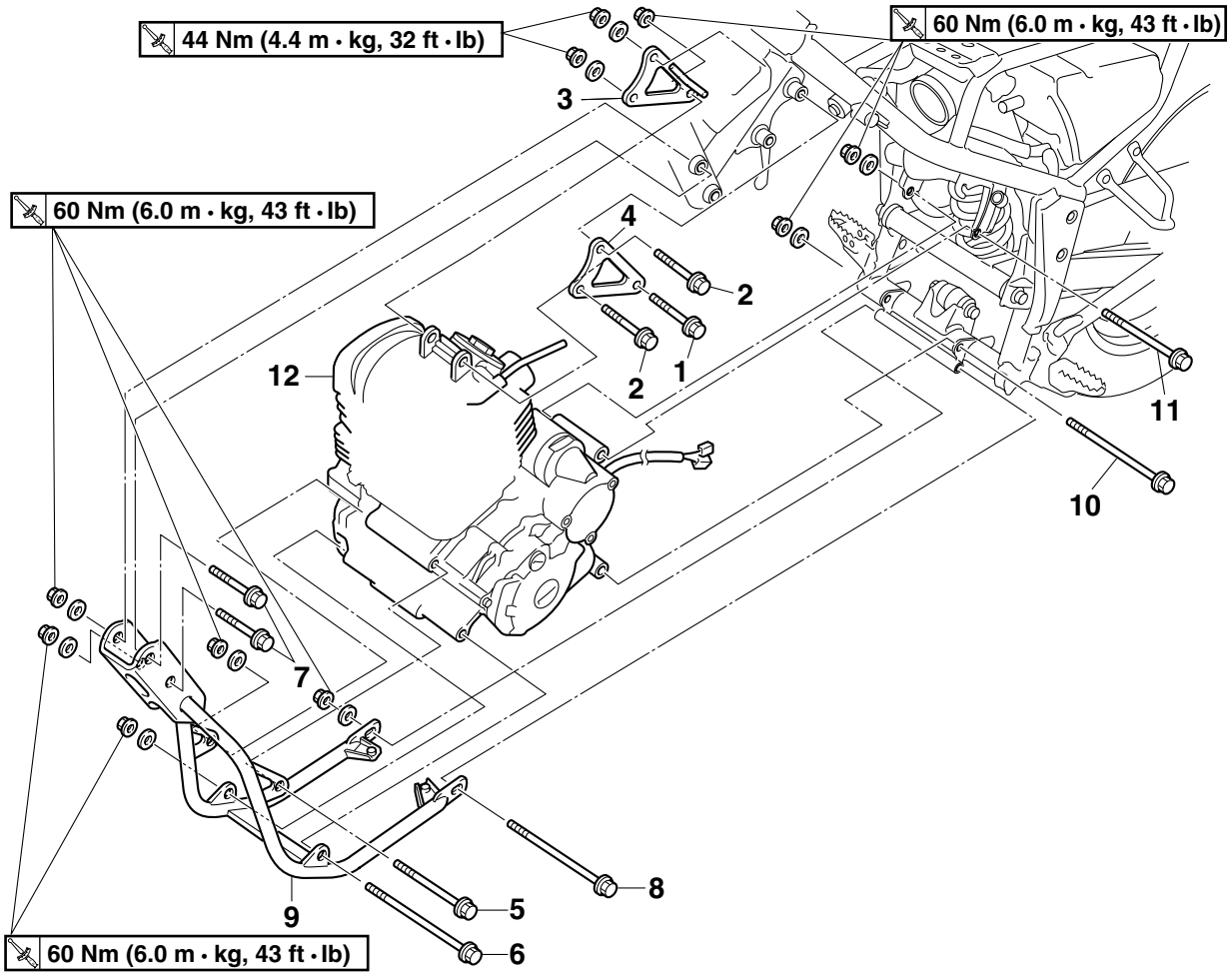
Order	Job/Parts to remove	Q'ty	Remarks
	Rear right side cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Muffler	1	
2	Exhaust pipe	1	
3	Exhaust pipe gasket	1	
			For installation, reverse the removal procedure.

Removing the shift pedal assembly and leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Carburetor		Refer to "CARBURETOR" on page 6-3.
	Drive sprocket		Refer to "CHAIN DRIVE" on page 4-57.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-50.
1	Cylinder head breather hose	1	Disconnect.
2	Spark plug cap	1	Disconnect.
3	Clutch cable	1	Disconnect.
4	Pickup coil coupler/stator assembly coupler	1/1	Disconnect.
5	Speed sensor coupler	1	Disconnect.
6	Horn	1	
7	Shift pedal assembly	1	
8	Neutral switch lead	1	Disconnect.
			For installation, reverse the removal procedure.

Removing the engine

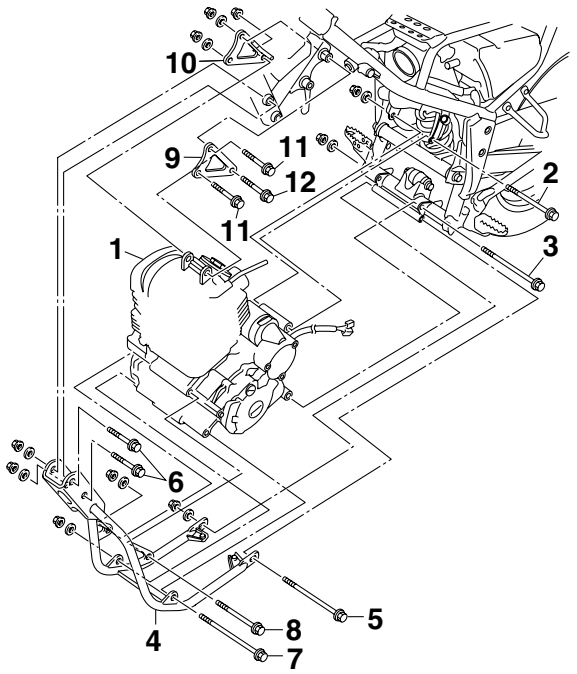


Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: Use an appropriate vehicle stand and support the engine securely.
	Drain the engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-11.
1	Engine mounting bolt (upper side)	1	
2	Engine bracket bolt	2	
3	Right engine bracket	1	
4	Left engine bracket	1	
5	Engine mounting bolts (front upper side)	1	
6	Engine mounting bolt (front lower side)	1	
7	Down tube bolts (front side)	2	
8	Down tube bolts (rear side)	1	
9	Down tube	1	
10	Engine mounting bolt (rear lower side)	1	
11	Engine mounting bolt (rear upper side)	1	
12	Engine assembly	1	
			For assembly, reverse the removal procedure.

EAS23720
INSTALLING THE ENGINE

1. Install:
   - Engine assembly “1”
   - Engine mounting bolt (rear upper side)“2”
   - Engine mounting bolt (rear lower side)“3”
   - Down tube “4”
   - Down tube bolt (Rear)“5”
   - Down tube bolt (Front)“6”
   - Engine mounting bolt (front lower side)“7”
   - Engine mounting bolts (front upper side)“8”
   - Left engine bracket “9”
   - Right engine bracket “10”
   - Engine bracket bolt “11”
   - Engine mounting bolt (upper side)“12”

NOTE:
The bolts and nuts must be tightened temporarily in this stage.(Temporarily tighten)



2. Tighten:
   - Engine mounting nut (rear upper)

	Engine mounting nut (rear upper) **60 Nm (6.0 m•kg, 43 ft•lb)**

   - Engine mounting nut (rear lower)

	Engine mounting nut (rear lower) **60 Nm (6.0 m•kg, 43 ft•lb)**

   - Down tube nut (rear)

	Down tube nut (rear) **60 Nm (6.0 m•kg, 43 ft•lb)**

   - Down tube nut (front)

	Down tube nut (front) **60 Nm (6.0 m•kg, 43 ft•lb)**

   - Engine mounting nut (front upper)

	Engine mounting nut (front upper) **60 Nm (6.0 m•kg, 43 ft•lb)**

   - Engine mounting nut (front upper)

	Engine mounting nut (front upper) **60 Nm (6.0 m•kg, 43 ft•lb)**

   - Engine bracket nut

	Engine bracket nut **44 Nm (4.0 m•kg, 32 ft•lb)**

   - Engine mounting nut (upper)

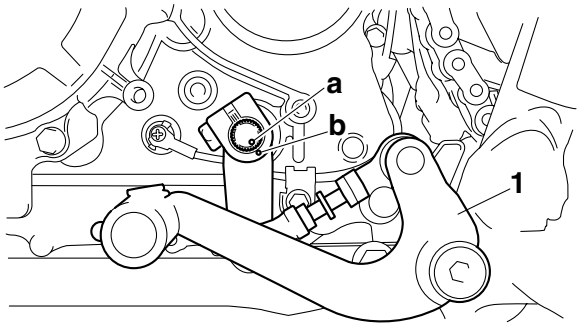
	Engine mounting nut (upper) **60 Nm (6.0 m•kg, 43 ft•lb)**

EAS3C51004
INSTALLING THE SHIFT PEDAL

1. Install:
   - Shift pedal assembly “1”

	Shift pedal bolt **30 Nm (3.0 m•kg, 22 ft•lb)** **Shift arm bolt** **10 Nm (1.0 m•kg, 7.2 ft•lb)**

NOTE:
Align mark “a” of the shift shaft with mark “b” of the shift arm.

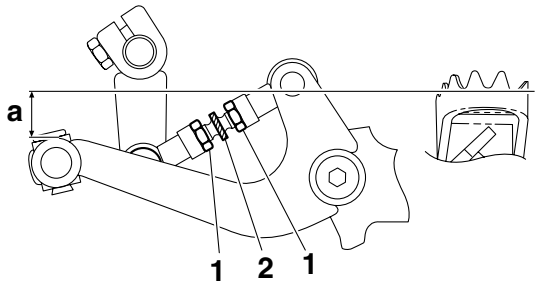


2. Adjust:
   - Shift pedal position

NOTE:
Loosen the lock nut “1” and turn shift rod “2” so that height “a” from the footrest to the shift pedal top face comes within 16 to 22 mm (0.63 to 0.79

in). When this adjustment is complete, tighten the locknut “1”.

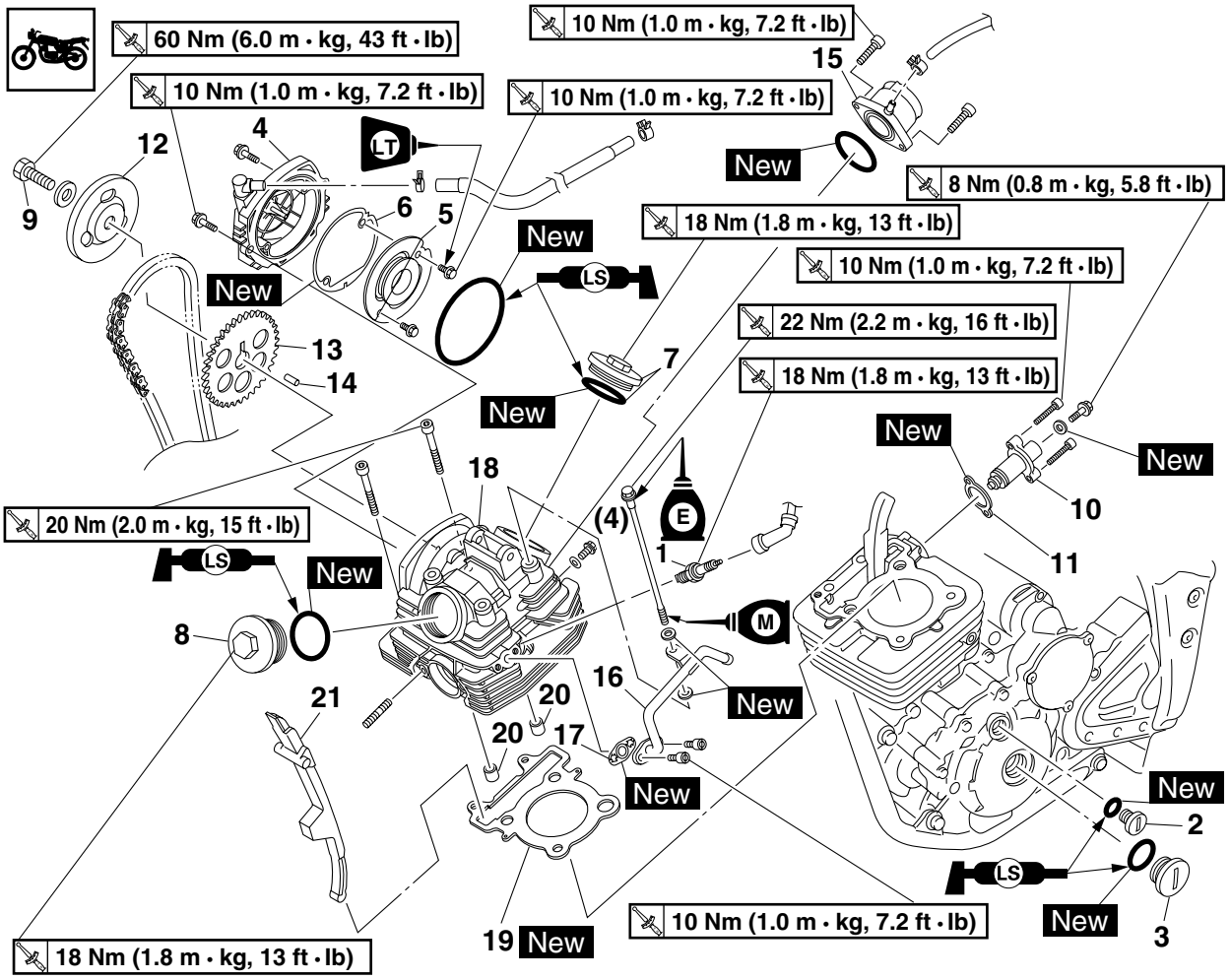
	Locknut **10 Nm (1.0 m•kg, 7.2 ft•lb)**



EAS24100

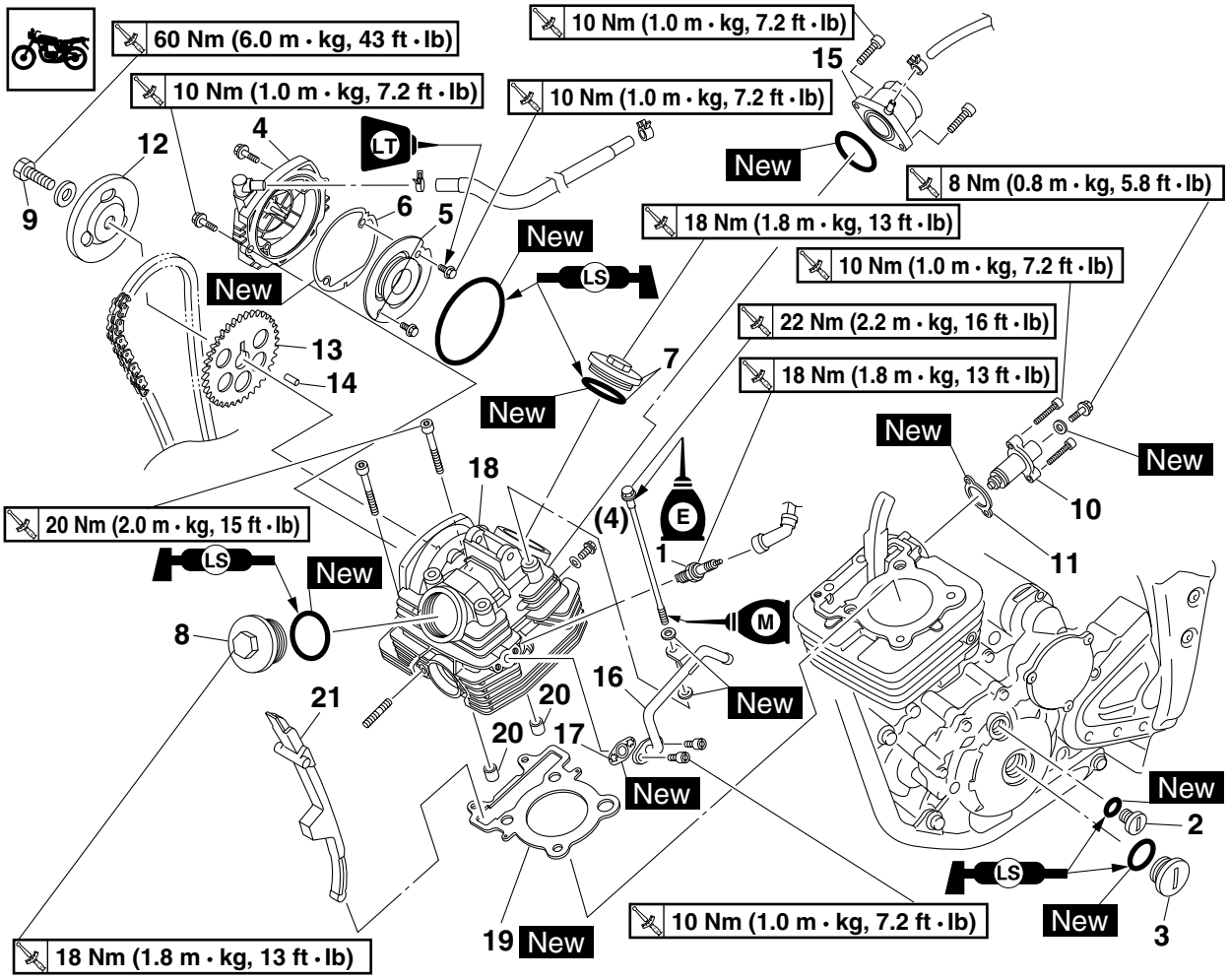
CYLINDER HEAD

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
	Tool box		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Left engine bracket/Right engine bracket		Refer to "ENGINE REMOVAL" on page 5-1.
1	Spark plug	1	
2	Timing mark accessing screw	1	
3	Crankshaft end cover	1	
4	Camshaft sprocket cover	1	
5	Breather plate	1	
6	Breather plate gasket	1	
7	Intake tappet cover	1	
8	Exhaust tappet cover	1	
9	Camshaft sprocket bolt	1	
10	Timing chain tensioner	1	
11	Timing chain tensioner gasket	1	
12	Camshaft sprocket plate	1	
13	Camshaft sprocket	1	
14	Dowel pin	1	
15	Intake manifold	1	

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
16	Air induction system pipe	1	
17	Air induction system pipe gasket	1	
18	Cylinder head	1	
19	Cylinder head gasket	1	
20	Dowel pin	2	
21	Timing chain guide (exhaust side)	1	
			For installation, reverse the removal procedure.

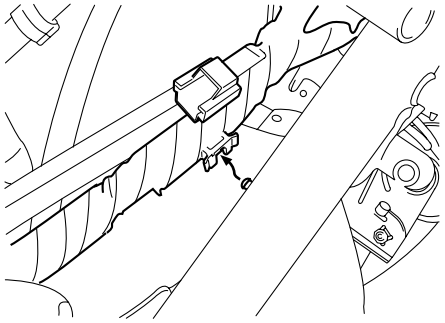
EAS24130

REMOVING THE CYLINDER HEAD

1. Disconnect:
   - Wire harness

NOTE:

Disconnect the wire harness from the T-stud of vehicle frame.



2. Align:
   - Mark “a” of the camshaft sprocket (with mark “b” of the cylinder head)

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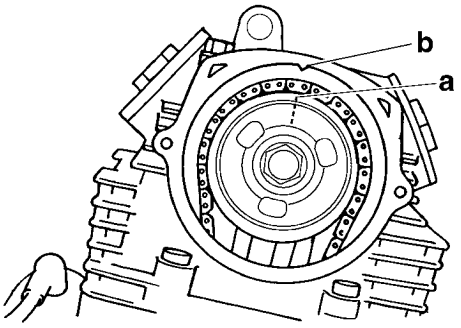
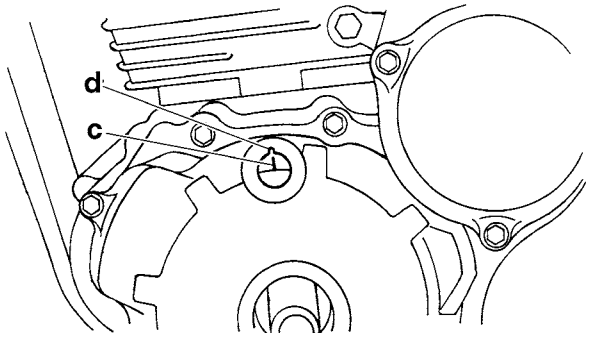
a. Turn the crankshaft counterclockwise.
b. When the piston is in the compression stroke, align camshaft sprocket mark “a” with cylinder head mark “b”. (Compression stroke TDC)



NOTE:

Make sure that generator rotor mark “c” aligns with generator rotor cover mark “d”.



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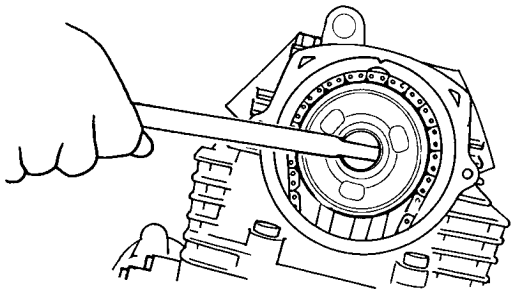
3. Loosen:
   - Camshaft sprocket bolt

NOTE:

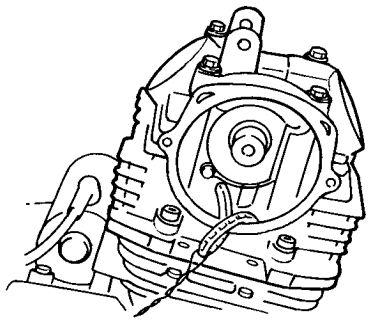
Tighten the generator rotor bolts but loosen the camshaft sprocket bolts using a wrench.



4. Remove:
   - Timing chain tensioner (along with the gasket)
   - Camshaft sprocket plate
   - Camshaft sprocket

NOTE:

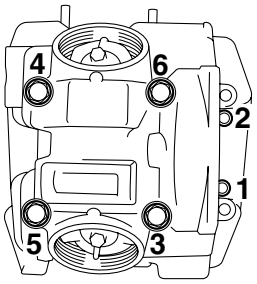
To prevent the timing chain from falling into the crankcase, fasten it with a wire.



5. Remove:
   - Cylinder head

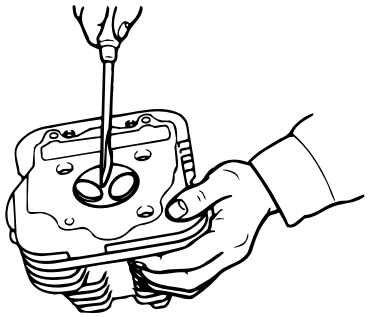
NOTE:

- Loosen the cylinder head bolts in the correct sequence as shown.
- Loosen each cylinder head bolt for a half turn at a time. When all cylinder head bolts are fully loosened, remove them.



EAS24160
CHECKING THE CYLINDER HEAD
1. Eliminate:
   - Combustion chamber carbon deposits (with a rounded scraper)

NOTE:
Do not use a sharp instrument to avoid damaging or scratching:
- Spark plug bore threads
- Valve seats



2. Check:
   - Cylinder head
     Damage/scratches → Replace.
3. Measure:
   - Cylinder head warpage
     Out of specification → Resurface the cylinder head.

	Warpage limit **0.03 mm (0.0012 in)**

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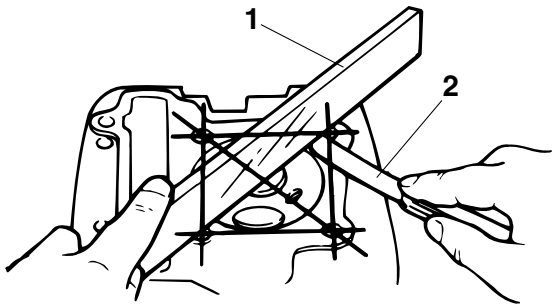
a. Place a straightedge "1" and a thickness gauge "2" across the cylinder head.
b. Measure the warpage.
c. If the limit is exceeded, resurface the cylinder head as follows.
d. Place a 400–600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE:
To ensure an even surface, turn the cylinder head several times.



e. When the cylinder head warpage is out of specification after resurfacing, replace the cylinder head.

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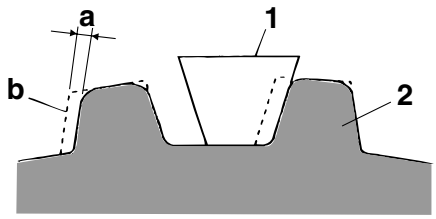
EAS23940
CHECKING THE TAPPET COVERS AND CAMSHAFT SPROCKET COVER
The following procedure applies to both of the tappet covers and O-rings.
1. Check:
   - Tappet cover
   - Camshaft sprocket cover

EAS3C51005
CHECKING THE CAMSHAFT SPROCKET AND TIMING CHAIN GUIDE (EXHAUST SYSTEM SIDE)
Check the camshaft sprocket and the timing chain guide (exhaust system side) as follows.
1. Check:
   - Camshaft sprocket
     Wear of 1/4 or more teeth "a" → Replace the camshaft sprocket as a set, timing chain, and crankshaft sprocket.



a. 1/4 tooth wear
b. Normal

1. Timing chain
2. Camshaft sprocket

2. Check:
   • Timing chain guide (exhaust side)
   Crack/wear → Replace.

EAS24200
CHECKING THE TIMING CHAIN TENSIONER

1. Check:
   • Timing chain tensioner
   Cracks/damage/rough movement → Replace.

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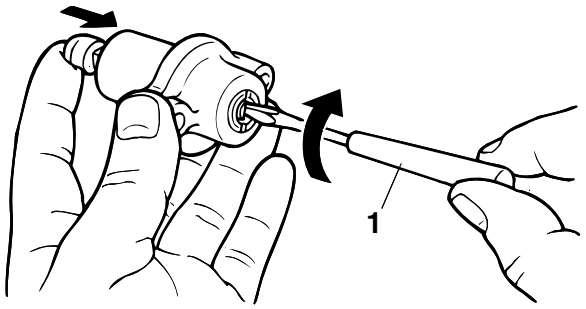
a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

NOTE:

While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver "1" until it stops.

b. Remove the screwdriver and slowly release the timing chain tensioner rod.
c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.



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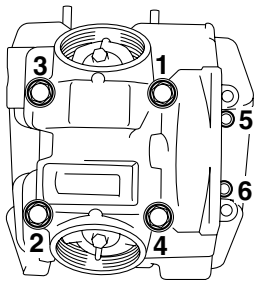
EAS24230
INSTALLING THE CYLINDER HEAD

1. Install:
   • Cylinder head
   • Cylinder head bolts (226 mm)
   • Cylinder head bolts (45 mm)

	**Cylinder head bolt (226 mm)** **22 Nm (2.2 m•kg, 16 ft•lb)** **Cylinder head bolt (45 mm)** **20 Nm (2.0 m•kg, 15 ft•lb)**

NOTE:

● Apply an engine oil to the seating face of cylinder head bolt (226-mm long), and apply a molybdenum disulfide oil to the bolt threads.
● Tighten the cylinder head bolts in two stages in the correct sequence as shown.



2. Install:
   • Dowel pin
   • Camshaft sprocket
   • Timing chain

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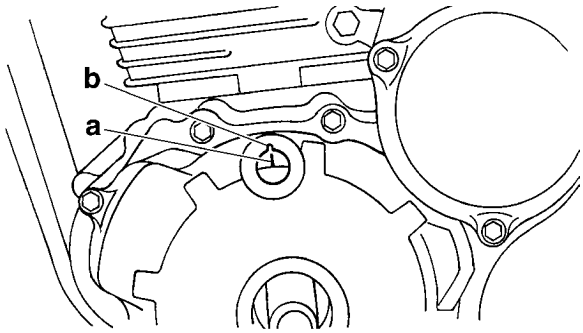
a. Make sure that generator rotor mark "a" aligns with generator rotor cover mark "b". If not, align them by turning the crankshaft counterclockwise.



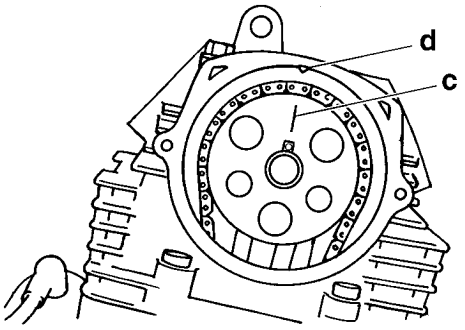
b. Align camshaft sprocket mark "c" with cylinder head mark "d".
c. Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft.

NOTE:

● When installing the camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.
● Align the dowel pin with the slot of camshaft sprocket.
● Assemble the camshaft sprocket by facing its die stamp outward of the vehicle.

ECA13770
CAUTION:

Do not turn the crankshaft when installing the camshaft sprockets to avoid damage or improper valve.



d. While holding the camshafts, temporarily tighten the camshaft sprocket bolts.
e. Remove the wire from the timing chain.

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3. Install:
   • Timing chain tensioner

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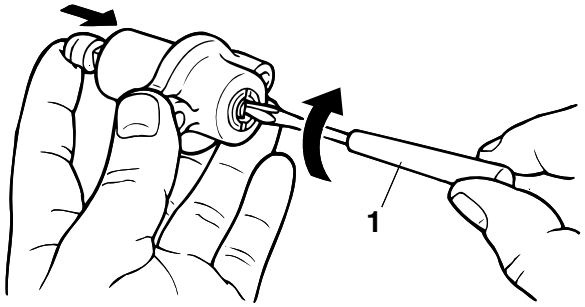
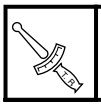
a. Push down the timing chain tensioner rod end by your finger, and fully wind up the tensioner clockwise using a small flat-blade screwdriver "1" .

NOTE:

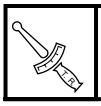
The timing chain tensioner rod must be held by the flat-blade screwdriver until the timing chain tensioner bolt is tightened.

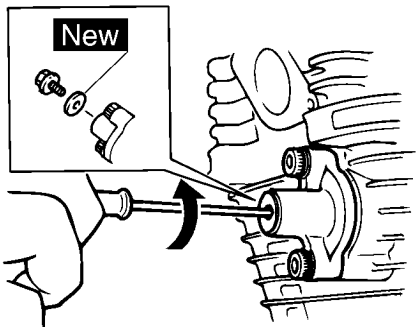


b. Assemble the timing chain tensioner and the gasket in the cylinder.

	**Timing chain tensioner bolt** **10 Nm (1.0 m•kg, 7.2 ft•lb)**

c. Install the gasket and timing chain tensioner cap bolt.

	**Timing chain tensioner cap bolt** **8 Nm (0.8 m•kg, 5.8 ft•lb)**



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4. Tighten:
   • Camshaft sprocket bolts

	**Camshaft sprocket bolt** **60 Nm (6.0 m•kg, 43 ft•lb)**

ECA13750

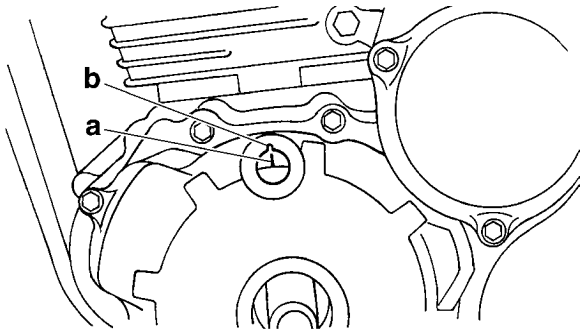
CAUTION:

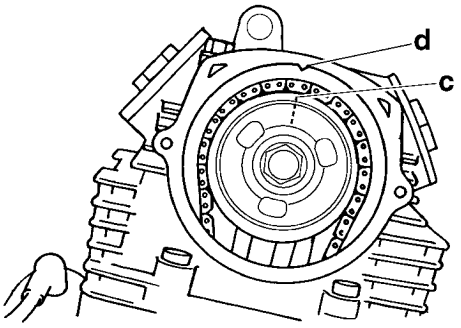
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

NOTE:

Secure the generator rotor bolts and tighten the camshaft sprocket bolts using a wrench.

5. Turn:
   • Crankshaft
   (several turns counterclockwise)
6. Check:
   • Mark "a"
   Make sure that generator rotor mark "a" aligns with generator rotor cover mark "b".
   • Mark "c"
   Make sure that camshaft sprocket mark "c" aligns with cylinder head mark "d".
   Not aligned → Reassemble.
   See the following assembling procedure.



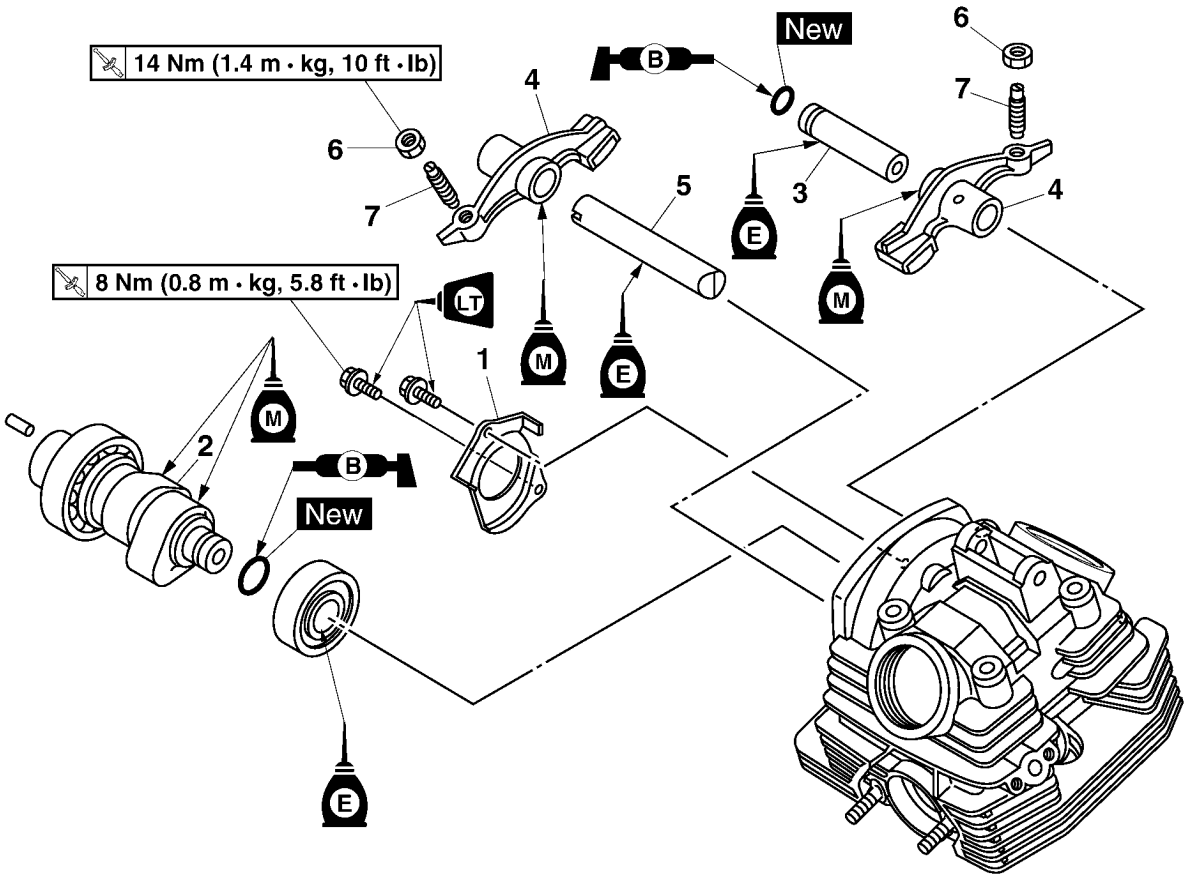


7. Measure:
   - Bulb clearance
     Out of specification → Adjust.
     Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.

EAS3C51006

CAMSHAFT

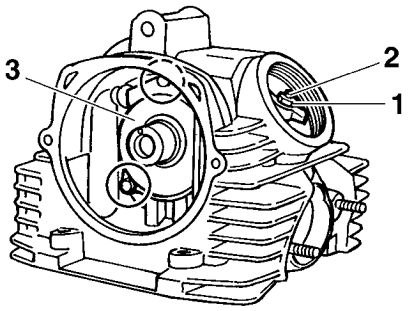
REMOVING THE ROCKER ARMS AND CAMSHAFT



Order	Job/Part	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-6.
1	Camshaft retainer	1	
2	Camshaft	1	
3	Intake rocker arm shaft	1	
4	Rocker arm	2	
5	Exhaust rocker arm shaft	1	
6	Locknut	2	
7	Valve clearance adjusting screws	2	
			For installation, reverse the removal procedure.

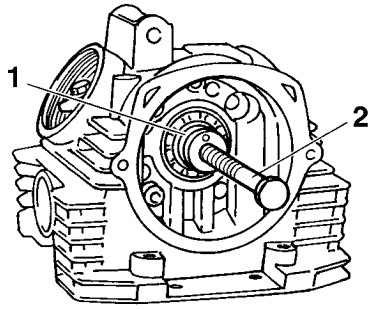
EAS23770
REMOVING THE ROCKER ARMS AND CAMSHAFT

1. Loosen:
   - Locknuts “1”
   - Valve clearance adjusting screws “2”
2. Remove:
   - Camshaft retainer “3”



3. Remove:
   - Camshaft “1”

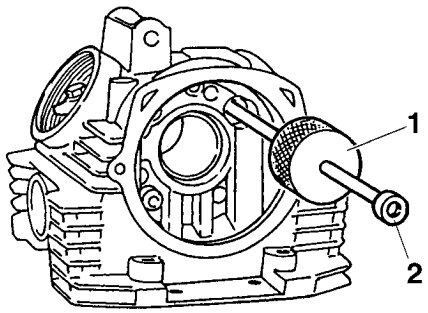
NOTE:
- Screw 10-mm bolt “2” into the threaded end of the camshaft and then pull out the camshaft.
- Take care not to interfere and damage the rocker arm.



4. Remove:
   - Intake rocker arm shaft
   - Exhaust rocker arm shaft
   - Rocker arm (Intake and exhaust sides)

NOTE:
Remove the rocker arm using the weight “1” and slide hammer bolt “2”.

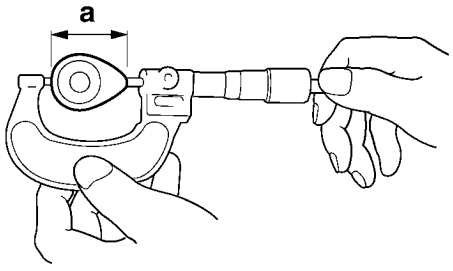
Slide hammer bolt
90890-01083
Slide hammer bolt 6 mm
YU-01083-1
Weight
90890-01084
YU-01083-3

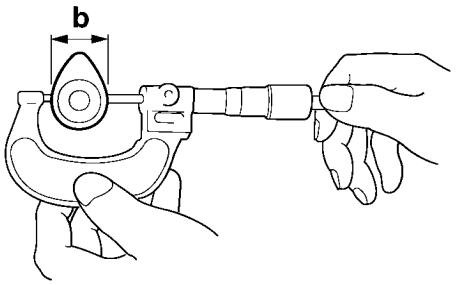


EAS23840
CHECKING THE CAMSHAFT

1. Check:
   - Camshaft lobes
     Blue discoloration/pitting/scratches → Replace the camshaft.
2. Measure:
   - Camshaft lobe dimensions “a” and “b”
     Out of specification → Replace the camshaft.

Camshaft lobe dimension limit
Intake A
36.520–36.620 mm
(1.4378–1.4417 in)
Limit
36.460 mm (1.4354 in)
Intake B
30.201–30.301 mm
(1.1890–1.1930 in)
Limit
30.151 mm (1.1870 in)
Exhaust A
36.564–36.664 mm
(1.4395–1.4435 in)
Limit
30.514 mm (1.4376 in)
Exhaust B
30.216–30.316 mm
(1.1896–1.1935 in)
Limit
30.166 mm (1.1876 in)





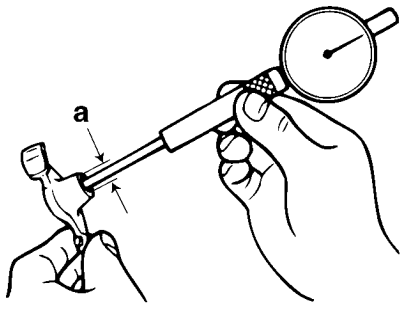
3. Check:
   • Camshaft oil passage
   Obstruction → Blow out with compressed air.

EAS23880
CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

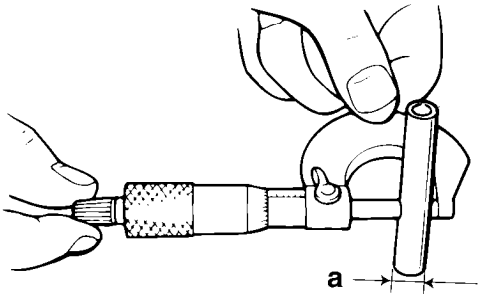
1. Check:
   • Rocker arm
   Damage/wear → Replace.
2. Check:
   • Rocker arm shaft
   Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.
3. Measure:
   • Rocker arm inside diameter “a”
   Out of specification → Replace.

Rocker arm inside diameter
12.000–12.018 mm (0.4724–0.4731 in)
Limit
12.036 mm (0.4739 in)



4. Measure:
   • Rocker arm shaft outside diameter “a”
   Out of specification → Replace.

Rocker arm shaft outside diameter
11.981–11.991 mm (0.4717–0.4721 in)
Limit
11.950 mm (0.4705 in)



5. Calculate:
   • Rocker-arm-to-rocker-arm-shaft clearance

NOTE:
Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Out of specification → Replace the defective part(s).

Rocker-arm-to-rocker-arm-shaft clearance
0.009–0.037 mm (0.0004–0.0015 in)

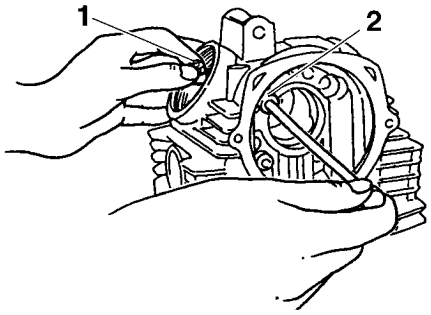
EAS24040
INSTALLING THE CAMSHAFT AND ROCKER ARMS

1. Lubricate:
   • Rocker arm
   • Rocker arm shafts

Recommended lubricant
Rocker arm
Molybdenum-disulfide oil
Rocker arm shaft
Engine oil

2. Install:
   • Exhaust rocker arm “1”
   • Exhaust rocker arm shaft “2”

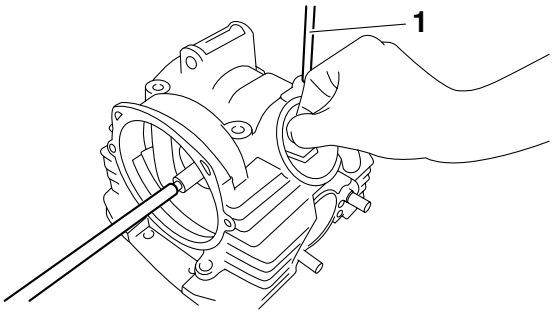
NOTE:
The exhaust rocker arm shaft must be inserted into the cylinder head completely.

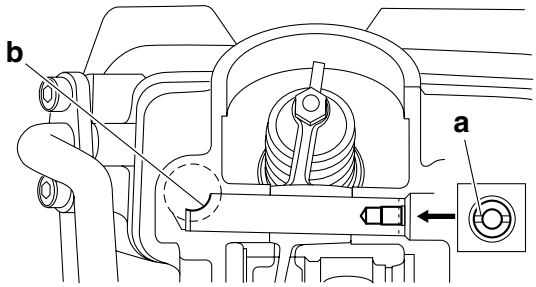


3. Install:
   - Intake rocker arm
   - Intake rocker arm shaft

NOTE:

- Insert cylinder head bolt "1" (226-mm long) into the cylinder head bolt hole.
- Keep slot "a" of intake rocker arm shaft in horizontal direction, align slot "b" of the shaft end with the cylinder head bolt hole, and assemble the camshaft.





4. Lubricate:
   - Camshaft

	Recommended lubricant **Camshaft** **Molybdenum-disulfide oil** **Camshaft bearing** **Engine oil**

5. Install:
   - Camshaft

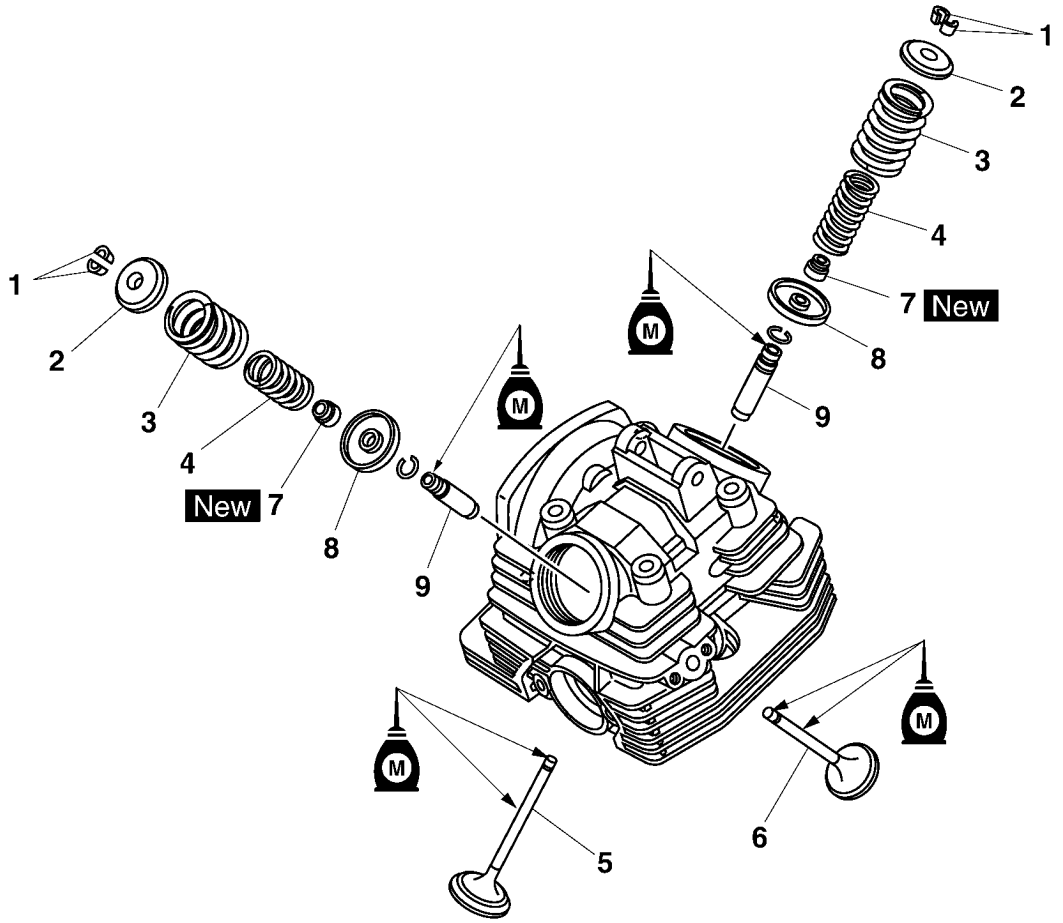
NOTE:

Assemble the camshaft by inserting the 10-mm bolt into the camshaft hole and tightening it.

EAS24270

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-6.
	Rocker arm/Camshaft		Refer to "CAMSHAFT" on page 5-13.
1	Valve cotter	4	
2	Valve spring retainer	2	
3	Outer valve spring	2	
4	Inner valve spring	2	
5	Intake valve	1	
6	Exhaust valve	1	
7	Valve stem seal	2	
8	Valve spring seat	2	
9	Valve guide	2	
			For installation, reverse the removal procedure.

EAS24280
REMOVING THE VALVES
The following procedure applies to all of the valves and related components.

NOTE:
Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

1. Check:
   - Valve sealing
     Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
     Refer to "CHECKING THE VALVE SEATS" on page 5-20.

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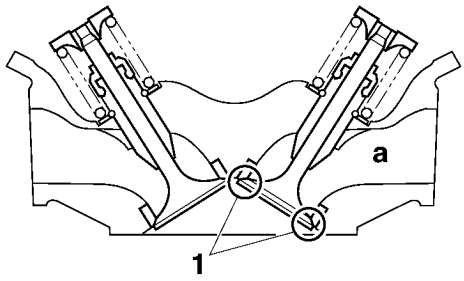
a. Pour a clean solvent "a" into the intake and exhaust ports.
b. Check that the valves properly seal.

NOTE:
There should be no leakage at the valve seat "1".



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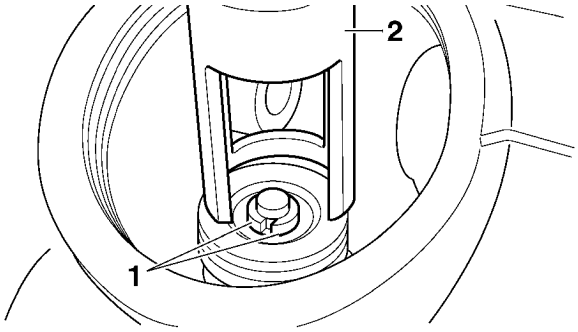
2. Remove:
   - Valve cotters "1"

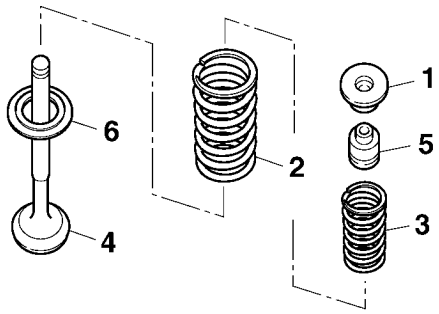
NOTE:
Remove the valve cotters by compressing the valve spring with the valve spring compressor "2".

Valve spring compressor
90890-04019
YM-04019



3. Remove:
   - Valve spring retainer "1"
   - Outer valve spring "2"
   - Inner valve spring "3"
   - Valve "4"
   - Valve stem seal "5"
   - Valve spring seat "6"

NOTE:
Identify the position of each part very carefully so that it can be reinstalled in its original place.

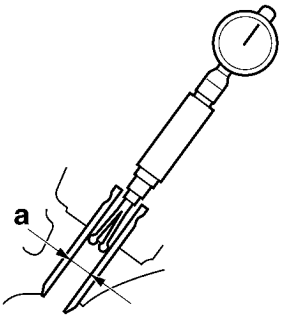


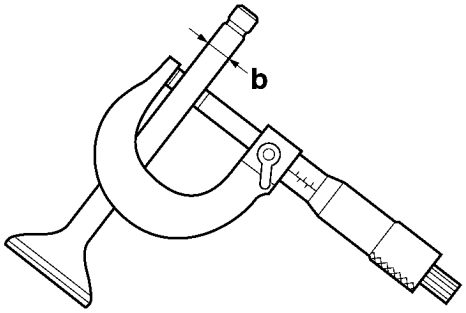
EAS24290
CHECKING THE VALVES AND VALVE GUIDES
The following procedure applies to all of the valves and valve guides.

1. Measure:
   - Valve-stem-to-valve-guide clearance
     Out of specification → Replace the valve guide.

Valve-stem-to-valve-guide clearance = Valve guide inside diameter "a" - Valve stem diameter "b"

Valve-stem-to-valve-guide clearance
Valve-stem-to-valve-guide clearance (intake)
0.010–0.037 mm (0.0004–0.0015 in)
Limit
0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)
0.025–0.052 mm (0.0010–0.0020 in)
Limit
0.100 mm (0.0039 in)





2. Replace:
- Valve guide

NOTE:
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C (212°F) in an oven.

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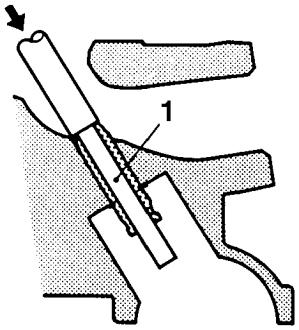
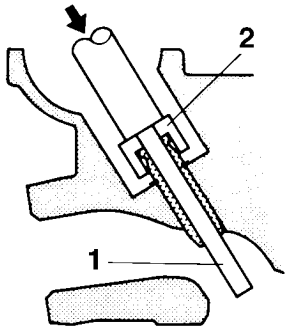
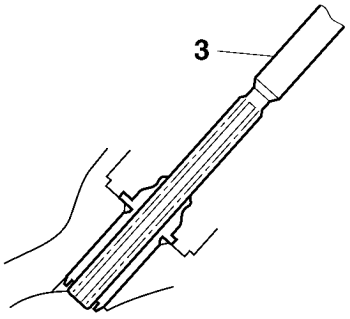
a. Remove the valve guide with the valve guide remover "1".



b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".



c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



NOTE:
After replacing the valve guide, reface the valve seat.

Valve guide remover (ø6)
90890-04064
Valve guide remover (6.0 mm)
YM-04064-A
Valve guide installer (ø6)
90890-04065
Valve guide installer (6.0 mm)
YM-04065-A
Valve guide reamer (ø6)
90890-04066
Valve guide reamer (6.0 mm)
YM-04066

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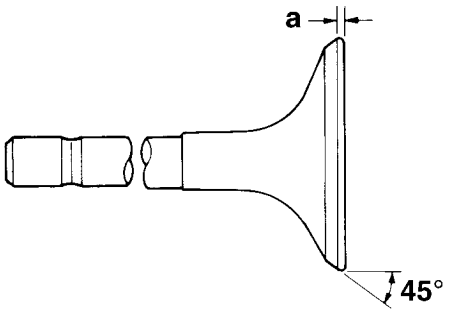
3. Eliminate:
   - Carbon deposits
     (from the valve face and valve seat)
4. Check:
   - Valve face
     Pitting/wear → Grind the valve face.
   - Valve stem end
     Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
   - Valve margin thickness "a"
     Out of specification → Replace the valve.

Valve margin thickness
Valve margin thickness D (intake)
0.80–1.20 mm (0.0315–0.0472 in)
Valve margin thickness D (exhaust)
0.80–1.20 mm (0.0315–0.0472 in)

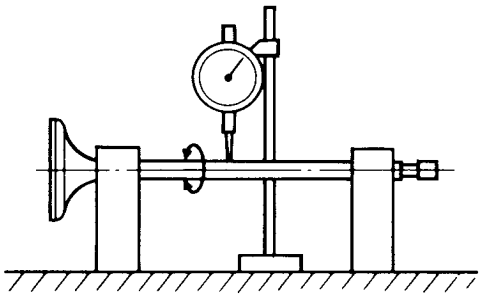


6. Measure:
   - Valve stem runout
     Out of specification → Replace the valve.

NOTE:

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.

Valve stem runout
Valve stem runout
0.030 mm (0.0012 in)



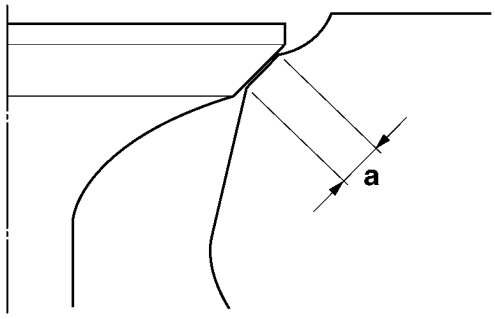
EAS24300

CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

1. Eliminate:
   - Carbon deposits
     (from the valve face and valve seat)
2. Check:
   - Valve seat
     Pitting/wear → Replace the cylinder head.
3. Measure:
   - Valve seat width "a"
     Out of specification → Replace the cylinder head.

Limit of valve seat width (IN)
1.7 mm
Limit of valve seat width (EX)
1.7 mm



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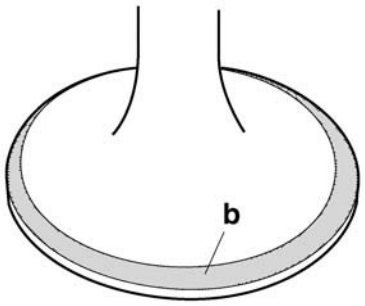
a. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
d. Measure the valve seat width.

NOTE:
Where the valve seat and valve face contacted one another, the blueing will have been removed.

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4. Lap:
   - Valve face
   - Valve seat

NOTE:
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

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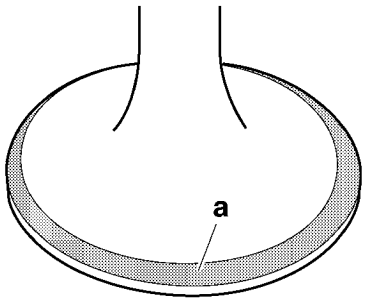
a. Apply a coarse lapping compound "a" to the valve face.

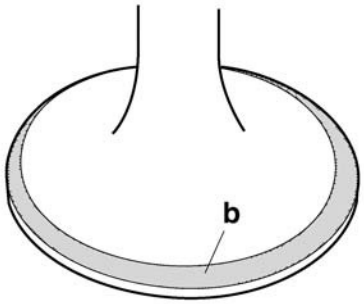
ECA13790
CAUTION:
Do not let the lapping compound enter the gap between the valve stem and the valve guide.



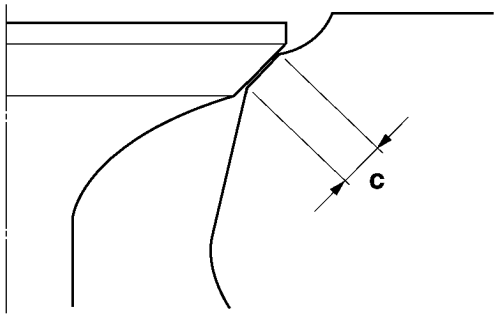
b. Apply molybdenum disulfide oil onto the valve stem.
c. Install the valve into the cylinder head.
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

NOTE:
For the best lapping results, lightly tap the valve seat while turning the valve back and forth between your hands.

e. Apply a fine lapping compound to the valve face and repeat the above steps.
f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
g. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



h. Install the valve into the cylinder head.
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
j. Measure the valve seat width "c" again. If the valve seat width is out of specification, reface and lap the valve seat.



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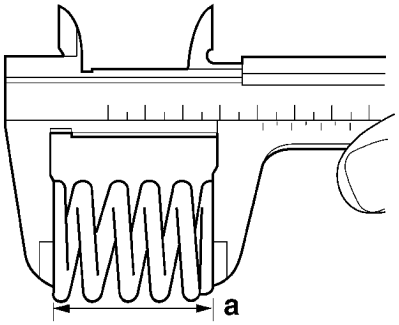
EAS24310
CHECKING THE VALVE SPRINGS

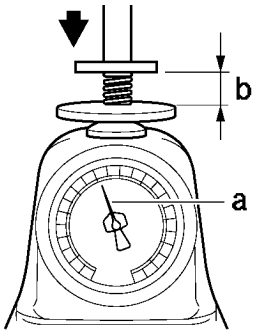
The following procedure applies to all of the valve springs.

1. Measure:
   - Valve spring free length "a"
     Out of specification → Replace the valve spring.

Valve spring free length
Inner spring
Free length (intake)
36.17 mm (1.42 in)
Free length (exhaust)
36.17 mm (1.42 in)
Outer spring
Free length (intake)
36.63 mm (1.44 in)
Free length (exhaust)
36.63 mm (1.44 in)



2. Measure:
• Compressed valve spring force “1”
Out of specification → Replace the valve spring.

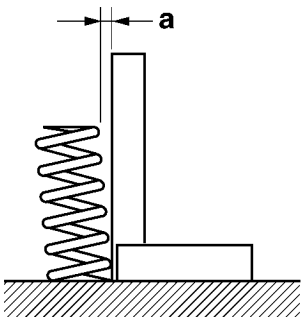


a. Compressed valve spring force
b. Installed length

Inner spring
Installed compression spring force (intake)
75.00–91.70 N (16.86–20.61 lbf) (7.65–9.35 kgf)
Installed length (intake)
30.50 mm (1.20 in)
Installed compression spring force (exhaust)
75.00–91.70 N (16.86–20.61 lbf) (7.65–9.35 kgf)
Installed length (exhaust)
30.50 mm (1.20 in)
Outer spring
Installed compression spring force (intake)
128.50–157.90 N (28.89–35.50 lbf) (13.10–16.10 kgf)
Installed length (intake)
32.00 mm (1.26 in)
Installed compression spring force (exhaust)
128.50–157.90 N (28.89–35.50 lbf) (13.10–16.10 kgf)
Installed length (exhaust)
32.00 mm (1.26 in)

3. Measure:
• Valve spring tilt “a”
Out of specification → Replace the valve spring.

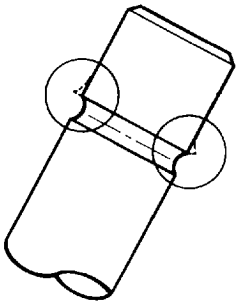
Spring tilt limit
Inner spring
Spring tilt (intake)
2.5 °/1.6 mm
Spring tilt (exhaust)
2.5 °/1.6 mm
Outer spring
Spring tilt (intake)
2.5 °/1.6 mm
Spring tilt (exhaust)
2.5 °/1.6 mm



EAS24340
INSTALLING THE VALVES

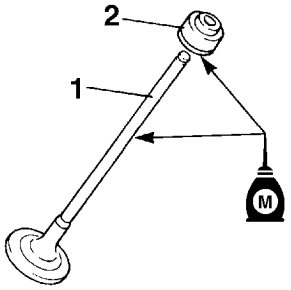
The following procedure applies to all of the valves and related components.

1. Deburr:
   - Valve stem end
     (with an oil stone)



2. Lubricate:
   - Valve stem “1”
   - Valve stem seal “2”
     (with the recommended lubricant)

	Recommended lubricant **Molybdenum disulfide oil**



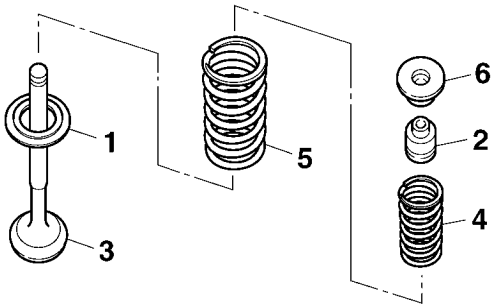
3. Install:
   - Valve spring seat “1”
   - Valve stem seal “2” New
   - Valve “3”
   - Inner valve spring “4”
   - Outer valve spring “5”
   - Valve spring retainer “6”
     (on to the cylinder cylinder head)

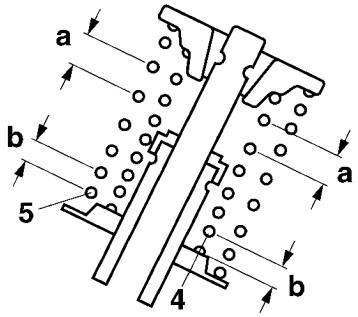
NOTE:

- Make sure each valve is installed in its original place. Refer to the following embossed marks.

Intake valve: “5HO:”
Exhaust valve: “5BP”

- Install the valve springs with the larger pitch “a” facing up.





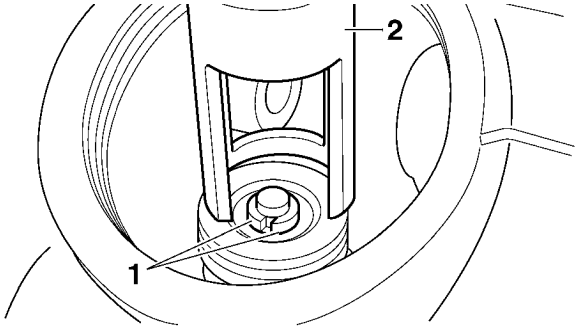
a. Larger pitch
b. Smaller pitch

4. Install:
   - Valve cotters “1”

NOTE:

Install the valve cotters by compressing the valve spring with the valve spring compressor “2”.

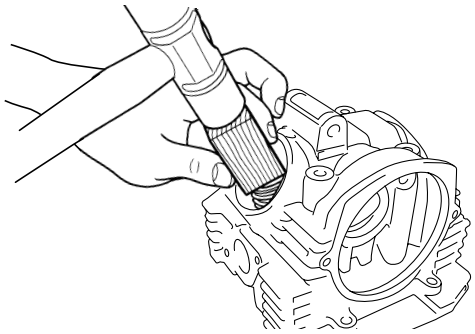
	Valve spring compressor **90890-04019** **YM-04019**



5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800
CAUTION:

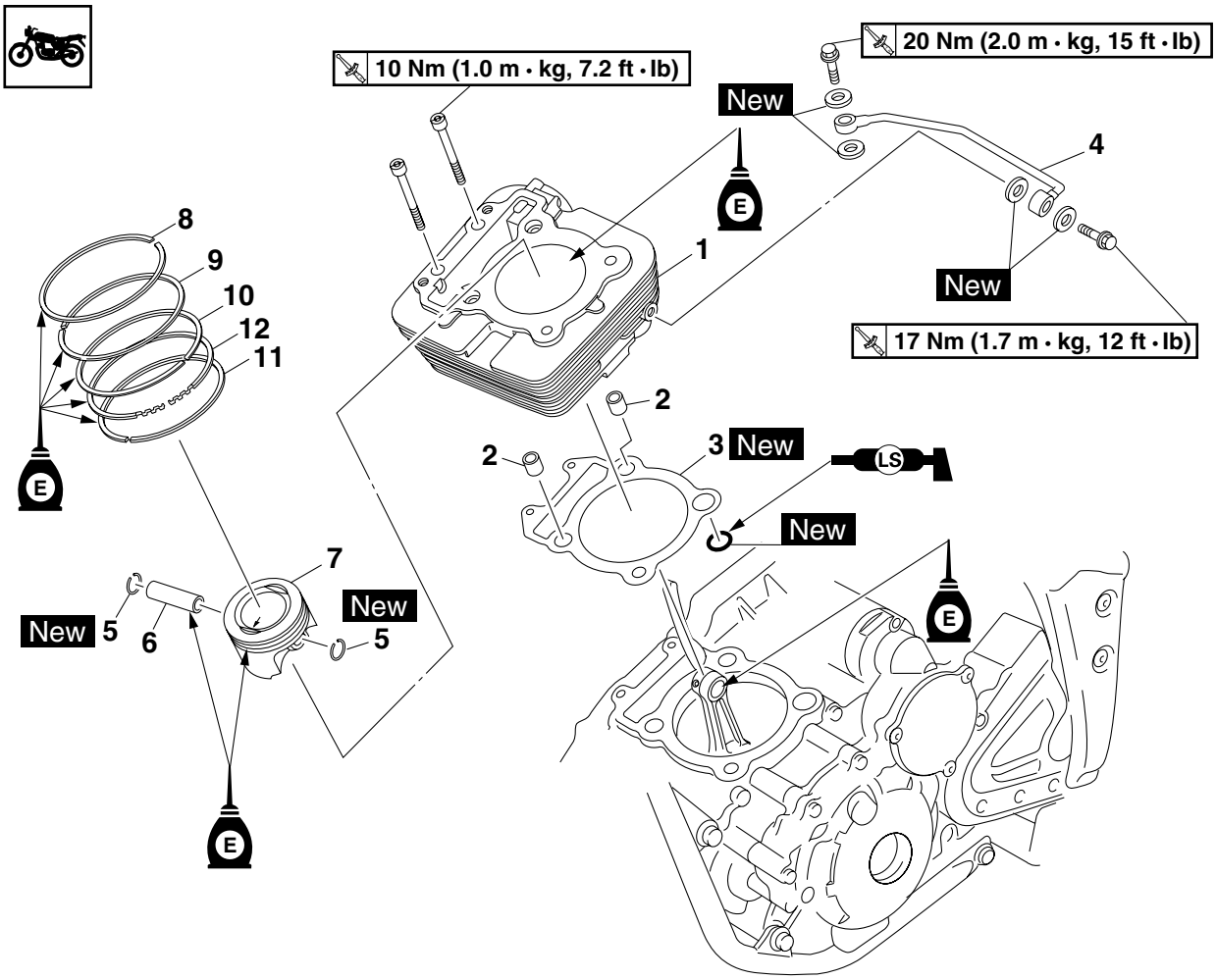
Hitting the valve tip with excessive force could damage the valve.



EAS24350

CYLINDER AND PISTON

Removing the cylinder and piston



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-6.
1	Cylinder	1	
2	Dowel pin	2	
3	Cylinder gasket	1	
4	Oil delivery pipe	1	
5	Piston pin clip	2	
6	Piston pin	1	
7	Piston	1	
8	Top ring	1	
9	2nd ring	1	
10	Upper oil ring rail	1	
11	Lower oil ring rail	1	
12	Oil ring expander	1	
			For installation, reverse the removal procedure.

EAS24380
REMOVING THE PISTON

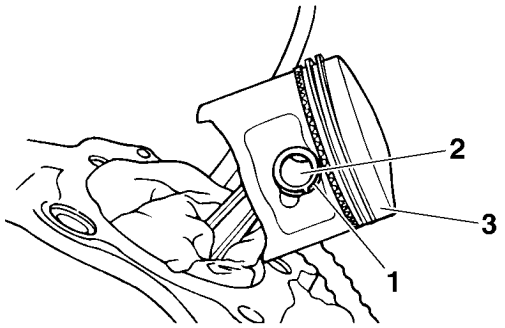
1. Remove:
   - Piston pin clips “1”
   - Piston pin “2”
   - Piston “3”

ECA13810
CAUTION:

Do not use a hammer to drive the piston pin out.

NOTE:

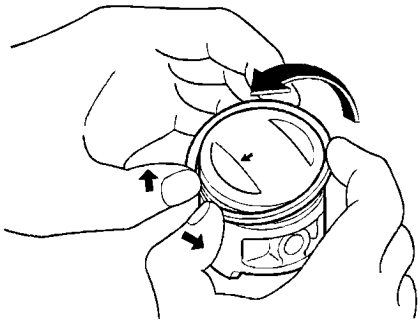
- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip’s groove and the piston’s pin bore area.



2. Remove:
   - Top ring
   - 2nd ring
   - Oil ring

NOTE:

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



EAS24390
CHECKING THE CYLINDER AND PISTON

1. Check:
   - Piston wall
   - Cylinder wall

   Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   - Piston-to-cylinder clearance

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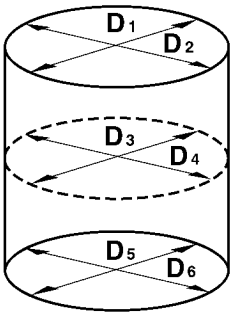
a. Measure cylinder bore “C” with the cylinder bore gauge.

NOTE:

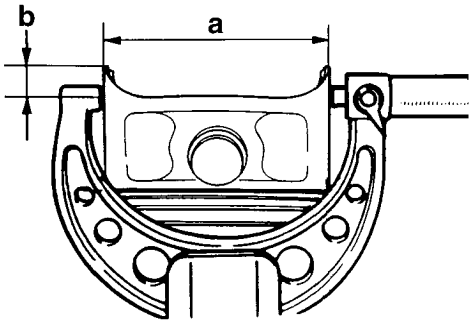
Measure cylinder bore “C” by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.



Bore
74.000–74.0µ16 mm
(2.9134–2.9140 in)
Wear limit
74.100 mm (2.9173 in)
Taper limit
0.050 mm (0.0020 in)
Out of round limit
0.010 mm (0.0004 in)

“C” = maximum of D_1–D_2
“T” = maximum of D_1 or D_2 - maximum of D_5 or D_6
“R” = maximum of D_1, D_3 or D_5 - maximum of D_2, D_4 or D_6

b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter D “a” with the micrometer.



a. Piston skirt diameter
b. 11 mm (0.43 in) from the bottom edge of the piston

Diameter D
73.983–73.998 mm
(2.9127–2.9133 in)

d. If out of specification, replace the piston and piston rings as a set.
e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance =
Cylinder bore "C" -
Piston skirt diameter "D"

Piston-to-cylinder clearance
0.010–0.025 mm (0.0004–0.0010 in)
Limit
0.15 mm (0.0059 in)

f. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

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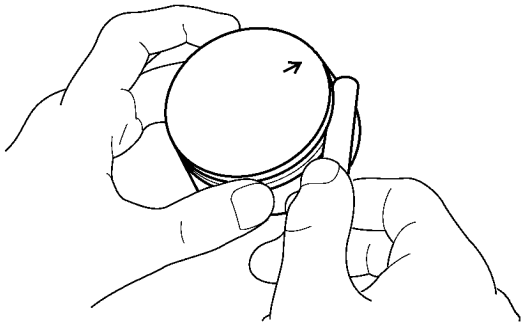
EAS24430
CHECKING THE PISTON RINGS

1. Measure:
   • Piston ring side clearance
   Out of specification → Replace the piston and piston rings as a set.

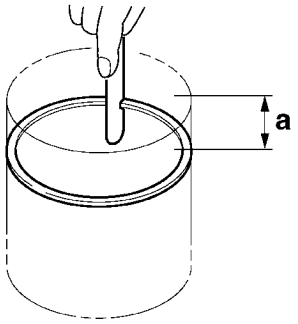
NOTE:
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Piston ring side clearance
Top ring
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)
Limit
0.115 mm (0.0045 in)
2nd ring
Ring side clearance
0.020–0.055 mm (0.0008–0.0022 in)
Limit
0.115 mm (0.0045 in)



2. Install:
   • Piston ring
   (into the cylinder)

NOTE:
Level the piston ring into the cylinder with the piston crown.



a. 40 mm (1.57 in)

3. Measure:
   • Piston ring end gap
   Out of specification → Replace the piston ring.

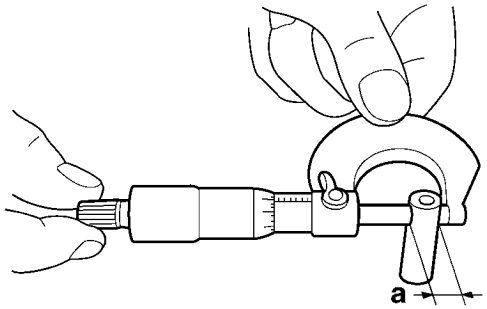
NOTE:
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring end gap
Top ring
End gap (installed)
0.19–0.31 mm (0.0075–0.0122 in)
Limit
0.60 mm (0.0236 in)
2nd ring
End gap (installed)
0.30–0.45 mm (0.0118–0.0177 in)
Limit
0.60 mm (0.0236 in)
Oil ring
End gap (installed)
0.10–0.35 mm (0.0039–0.0138 in)

EAS24440
CHECKING THE PISTON PIN

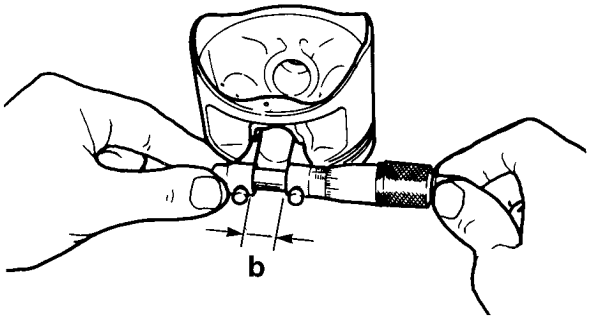
1. Check:
   - Piston pin
     Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
   - Piston pin outside diameter "a"
     Out of specification → Replace the piston pin.

Piston pin outside diameter
15.991–16.000 mm
(0.6296–0.6299 in)
Limit
15.971 mm (0.6288 in)



3. Measure:
   - Piston pin bore diameter "b"
     Out of specification → Replace the piston.

Piston pin bore inside diameter
16.002–16.013 mm
(0.6300–0.6304 in)
Limit
16.043 mm (0.6316 in)



4. Calculate:
   - Piston-pin-to-piston-pin-bore clearance
     Out of specification → Replace the piston pin and piston as a set.

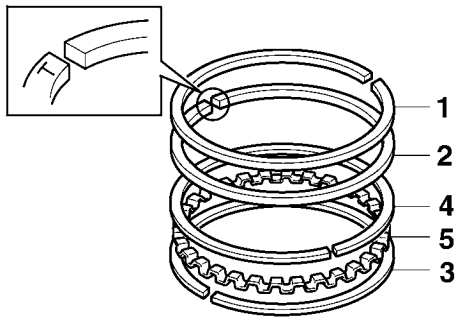
Piston-pin-to-piston-pin-bore clearance =
Piston pin bore diameter "b" -
Piston pin outside diameter "a"

Piston-pin-to-piston-pin-bore clearance
0.002–0.022 mm (0.0001–0.0009 in)

EAS24450
INSTALLING THE PISTON AND CYLINDER

1. Install:
   - Top ring "1"
   - 2nd ring "2"
   - Lower oil ring rail "3"
   - Upper oil ring rail "4"
   - Oil ring expander "5"

NOTE:
Be sure to install the top ring and 2nd ring so that the manufacturer's marks or numbers face up.



2. Install:
   - Piston "1"
   - Piston pin "2"
   - Piston pin clips "3" New

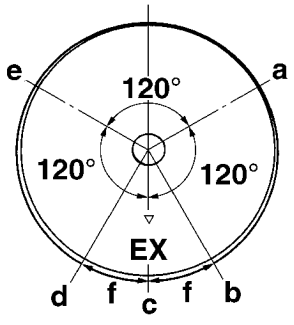
NOTE:
- Apply engine oil to the piston pin.

- Make sure the arrow mark "a" on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.

3. Lubricate:
   - Piston
   - Piston rings
   - Cylinder
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**

4. Offset:
   - Piston ring end gaps



a. Top ring
b. Upper oil ring rail
c. Oil ring expander
d. Lower oil ring rail
e. 2nd ring
f. 20 mm (0.79 in)

5. Install:
   - Cylinder

	Cylinder bolt **10 Nm (1.0 m•kg, 7.2 ft•lb)**

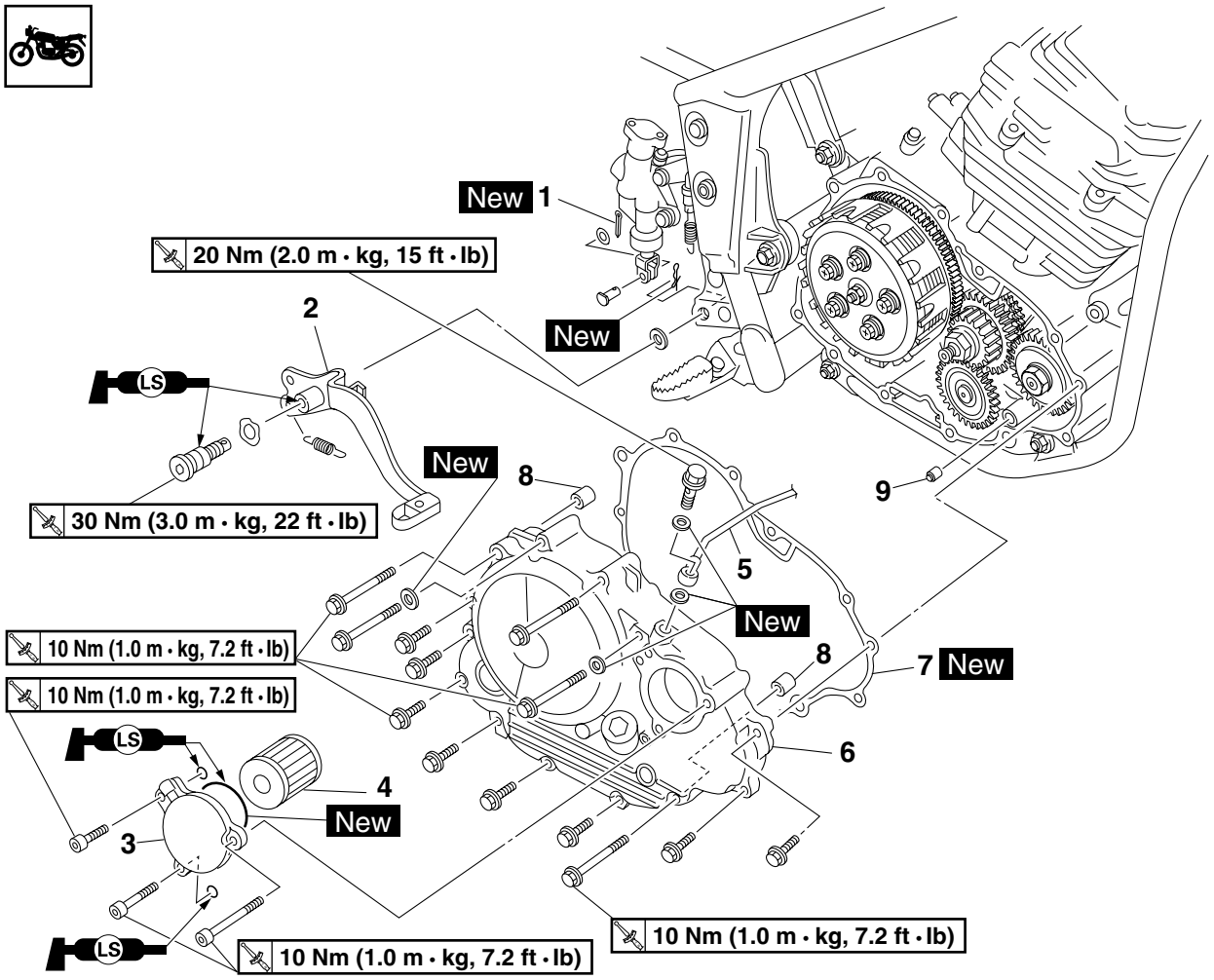
NOTE:

- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.

EAS25061

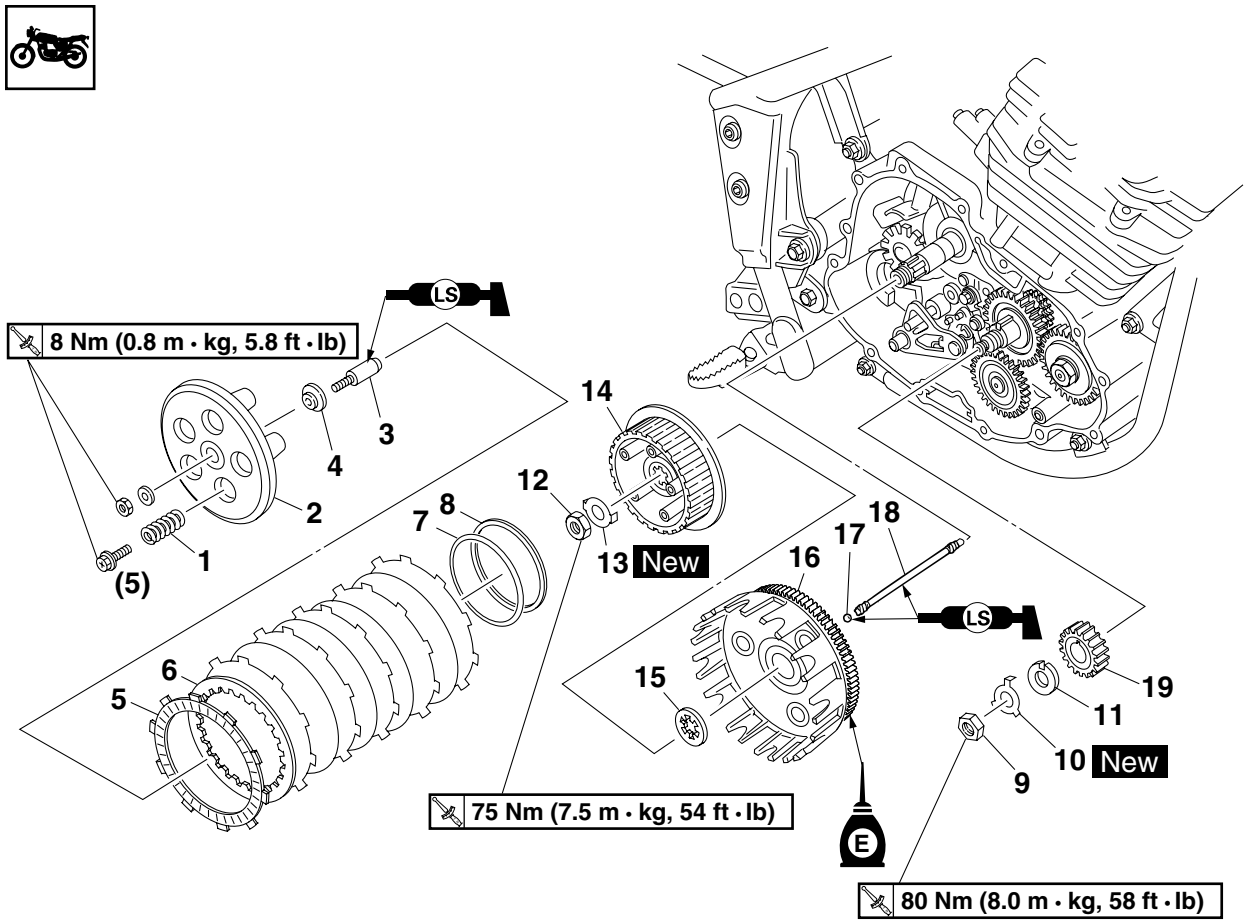
CLUTCH

Removing the clutch cover



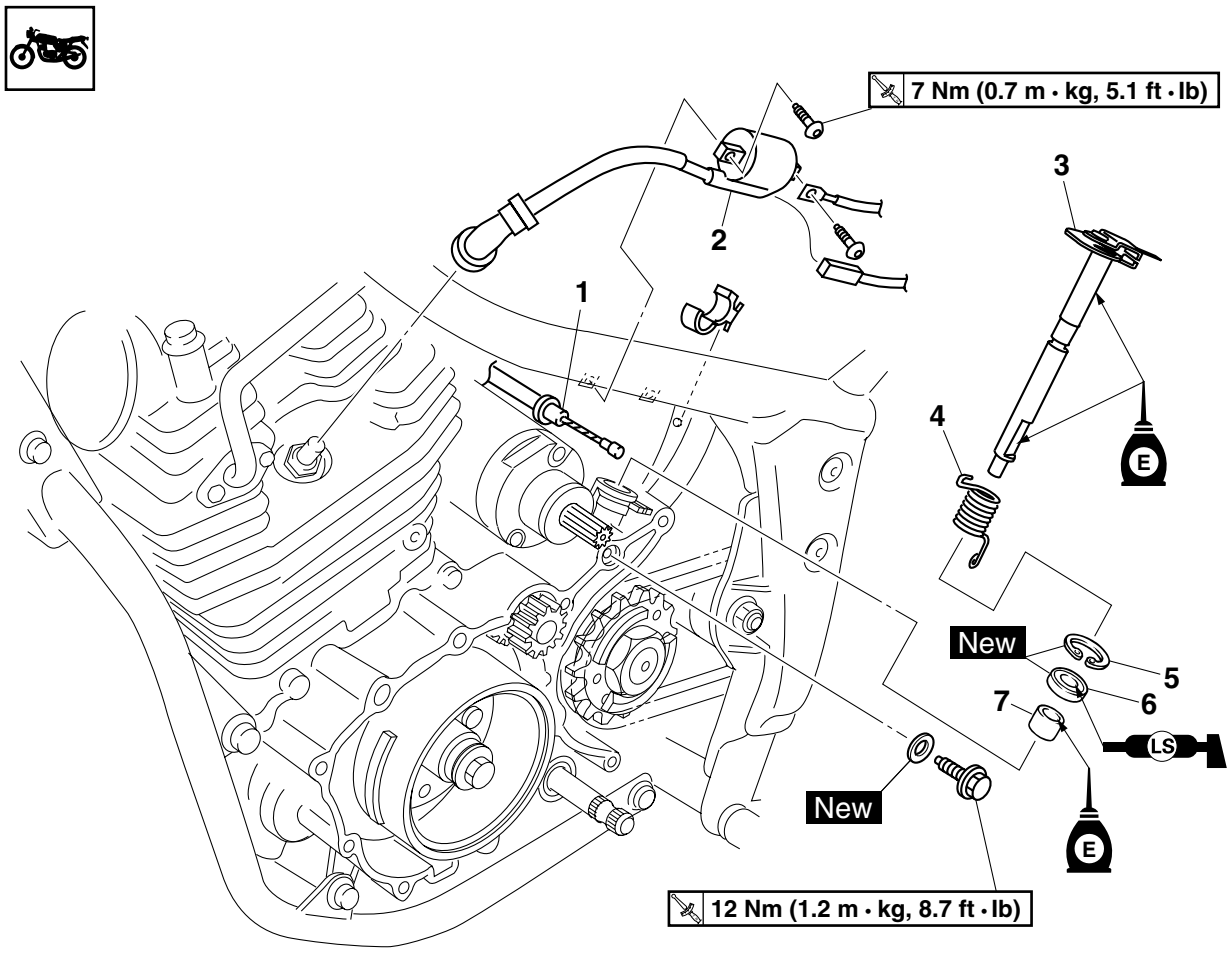
Order	Job/Parts to remove	Q'ty	Remarks
	Drain the engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-1.
1	Cotter pin	1	
2	Brake pedal	1	
3	Oil filter element cover	1	
4	Oil filter element	1	
5	Oil delivery pipe	1	Disconnect.
6	Clutch cover	1	
7	Clutch cover gasket	1	
8	Dowel pin	2	
9	Gasket	1	
			For installation, reverse the removal procedure.

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch spring	5	
2	Pressure plate	1	
3	Adjusting screw	1	
4	Push plate	1	
5	Friction plate	6	
6	Clutch plate	5	
7	Clutch damper spring	1	
8	Clutch damper spring seat	1	
9	Primary drive gear nut	1	
10	Lock washer	1	
11	Claw washer	1	
12	Clutch boss nut	1	
13	Lock washer	1	
14	Clutch boss	1	
15	Thrust washer	1	
16	Clutch housing	1	
17	Ball	1	
18	Clutch push rod	1	
19	Primary drive gear	1	
			For installation, reverse the removal procedure.

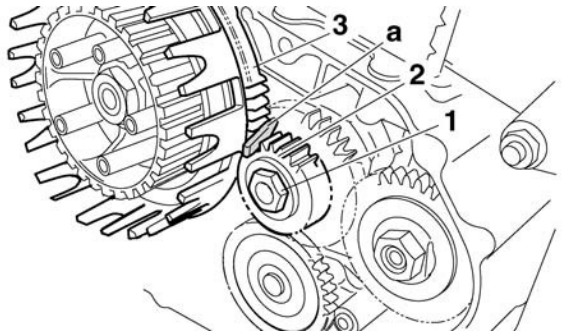
Removing the push lever shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 6-9.
	Generator rotor cover		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-45.
1	Clutch cable	1	
2	Ignition coil	1	
3	Push lever shaft	1	
4	Push lever spring	1	
5	Circlip	1	
6	Oil seal	1	
7	Bearing	1	
			For installation, reverse the removal procedure.

EAS25070
REMOVING THE CLUTCH
1. Straighten the lock washer tab.
2. Loosen:
   - Primary drive gear nut “1”

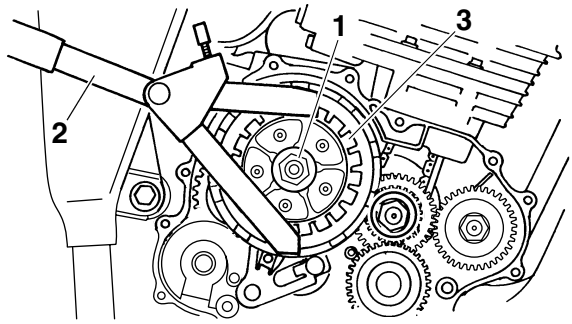
NOTE:
Insert aluminum plate “a” between primary drive gear “2” and primary driven gear “3”, and loosen the primary drive gear nut.



3. Loosen:
   - Clutch boss nut “1”

NOTE:
While holding the clutch boss “3” with the universal clutch holder “2”, loosen the clutch boss nut.

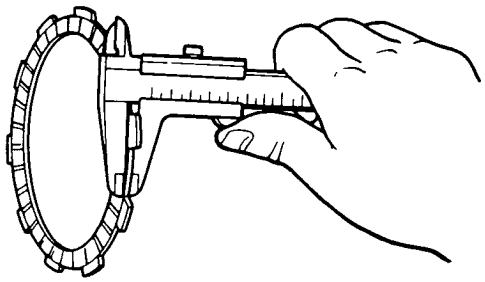
Universal clutch holder
90890-04086
YM-91042



EAS25100
CHECKING THE FRICTION PLATES
The following procedure applies to all of the friction plates.
1. Check:
   - Friction plate
     Damage/wear → Replace the friction plates as a set.
2. Measure:
   - Friction plate thickness
     Out of specification → Replace the friction plates as a set.

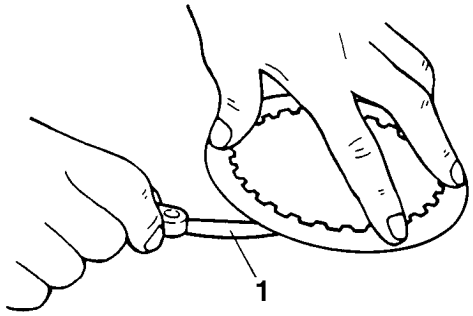
NOTE:
Measure the friction plate at four places.

Friction plate thickness
2.70–2.90 mm (0.106–0.114 in)
Wear limit
2.60 mm (0.1024 in)



EAS25110
CHECKING THE CLUTCH PLATES
The following procedure applies to all of the clutch plates.
1. Check:
   - Clutch plate
     Damage → Replace the clutch plates as a set.
2. Measure:
   - Clutch plate warpage
     (with a surface plate and thickness gauge “1”)
     Out of specification → Replace the clutch plates as a set.

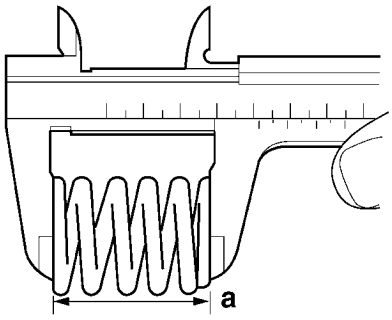
Warpage limit
0.20 mm (0.0079 in)



EAS25140
CHECKING THE CLUTCH SPRINGS
The following procedure applies to all of the clutch springs.
1. Check:
   - Clutch spring
     Damage → Replace the clutch springs as a set.
2. Measure:

- Clutch spring free length “a”
  Out of specification → Replace the clutch springs as a set.

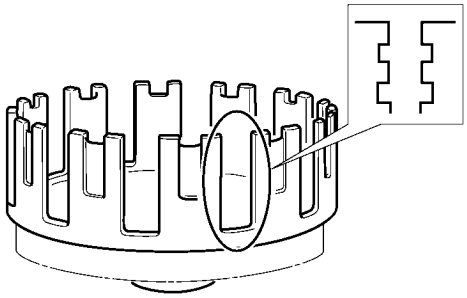
Clutch spring free length
40.10 mm (1.58 in)
Limit
38.10 mm (1.50 in)



EAS25150
CHECKING THE CLUTCH HOUSING

1. Check:
   - Clutch housing dogs
     Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

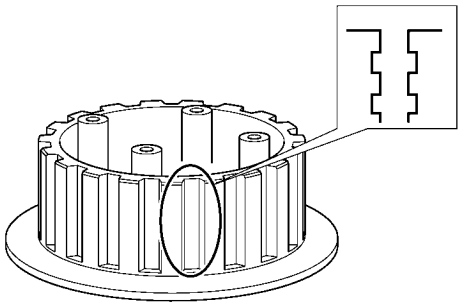
NOTE:
Pitting on the clutch housing dogs will cause erratic clutch operation.



EAS25160
CHECKING THE CLUTCH BOSS

1. Check:
   - Clutch boss splines
     Damage/pitting/wear → Replace the clutch boss.

NOTE:
Pitting on the clutch boss splines will cause erratic clutch operation.



EAS25170
CHECKING THE PRESSURE PLATE

1. Check:
   - Pressure plate
     Cracks/damage → Replace.

EAS25190
CHECKING THE CLUTCH PUSH RODS

1. Check:
   - Clutch push rod
   - Adjusting screw
   - Ball
     Cracks/damage/wear → Replace the defective part(s).
2. Measure:
   - Push rod bending limit
     Out of specification → Replace.

Push rod bending limit
0.500 mm (0.0197 in)

EAS25200
CHECKING THE PRIMARY DRIVE GEAR

1. Check:
   - Primary drive gear
     Damage/wear → Replace the primary drive and primary driven gears as a set.
     Excessive noise during operation → Replace the primary drive and primary driven gears as a set.

EAS25210
CHECKING THE PRIMARY DRIVEN GEAR

1. Check:
   - Primary driven gear
     Damage/wear → Replace the primary drive and primary driven gears as a set.
     Excessive noise during operation → Replace the primary drive and primary driven gears as a set.

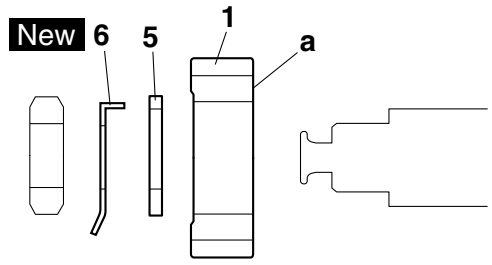
EAS25260
INSTALLING THE CLUTCH

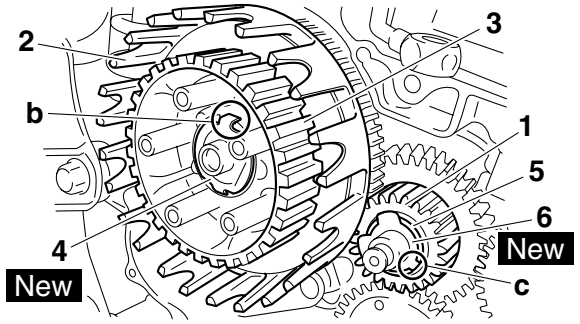
1. Install:
   - Primary drive gear “1”

- Clutch housing “2”
- Thrust washer
- Clutch boss “3”
- Lock washer “4” New
- Claw washer “5”
- Lock washer “6” New

NOTE:

- Assemble the primary drive gear by facing its flat face “a” toward the crankcase.
- Align lock washer projection “b” with the clutch boss slit during assembling.
- Align lock washer projection “c” with the claw washer slit during assembling.





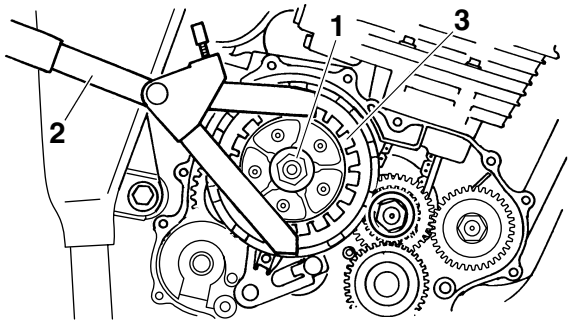
2. Install:
   - Clutch boss nut
   - Primary drive gear nut
3. Tighten:
   - Clutch boss nut “1”

	Clutch boss nut **75 Nm (7.5 m•kg, 54 ft•lb)**

NOTE:

While holding the clutch boss “3” with the universal clutch holder “2”, tighten the clutch boss nut.

	Universal clutch holder **90890-04086** **YM-91042**

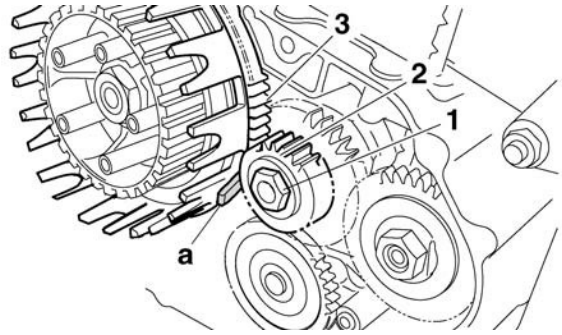


4. Tighten:
   - Primary drive gear nut “1”

	Primary drive gear nut **80 Nm (8.0 m•kg, 58 ft•lb)**

NOTE:

Insert aluminum plate “a” between primary drive gear “2” and primary driven gear “3”, and tighten the primary drive gear nut.



5. Be sure to bend the lock washer tab along to the nut side face.
6. Lubricate:
   - Friction plates
   - Clutch plates

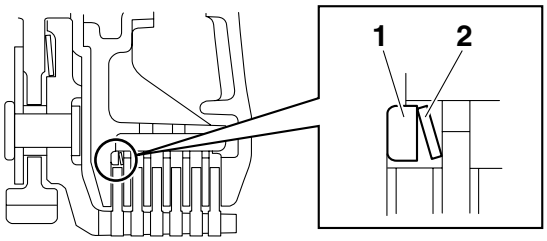
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**

7. Install:
   - Clutch damper spring seat “1”
   - Clutch damper spring “2”
   - Friction plates
   - Clutch plates

NOTE:

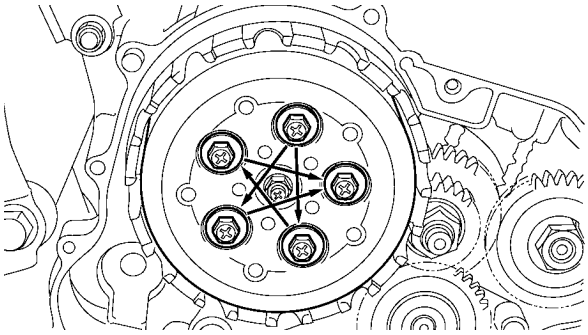
- Assemble the clutch dumper spring seat and the clutch damper spring as shown.
- First, install the friction plate and then alternate between the clutch plates and friction plates.



8. Install:
   - Pressure plate
   - Adjusting screw
   - Pressure plate
   - Clutch springs

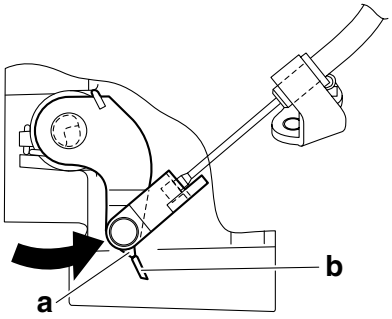
NOTE:
Tighten the clutch spring bolts in two stages and in a crisscross pattern.

	Adjusting screw lock nut **8 Nm (0.8 m•kg, 5.8 ft•lb)** **Clutch spring bolt** **8 Nm (0.8 m•kg, 5.8 ft•lb)**



9. Check:
   - Push lever position
     Push lever mark "a" and crankcase mark "b" not aligned → Correct.

NOTE:
Move the push lever in the arrow direction with your fingers, and check that it feels heavier when its mark aligns.



10. Adjust:
    - Push lever position

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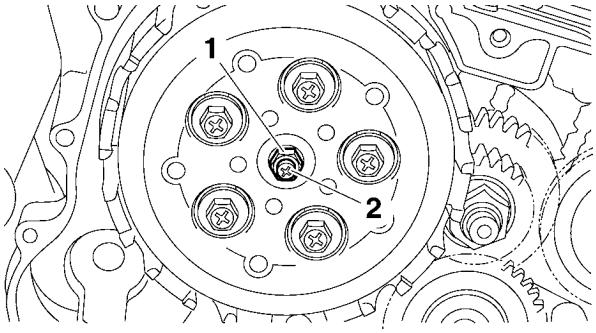
a. Loosen the locknut "1".
b. Turn the adjusting screw "2" in or out until the marks are aligned.
c. Hold the adjusting screw to prevent it from moving and then tighten the locknut to specification.

ECA13820
CAUTION:
Do not overtighten the locknut since this will remove the free play between both push rods.

	Locknut **8 Nm (0.8 m•kg, 5.8 ft•lb)**



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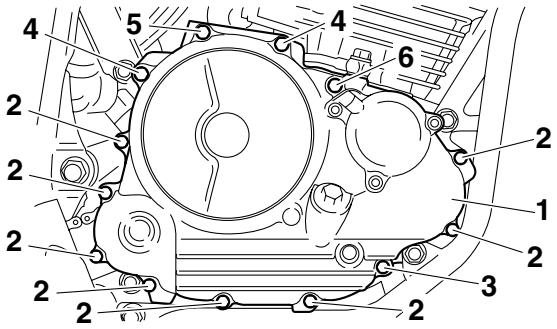
11. Install:
    - Clutch cover "1"

	Clutch cover bolt **10 Nm (1.0 m•kg, 7.2 ft•lb)**

NOTE:
Tighten the bolts diagonally.

- M6 × 25 mm bolt "2"
- M6 × 35 mm bolt "3"
- M6 × 50 mm bolt "4"
- M6 × 50 mm bolt (with gasket)"5"
- M6 × 55 mm bolt (with gasket)"6"

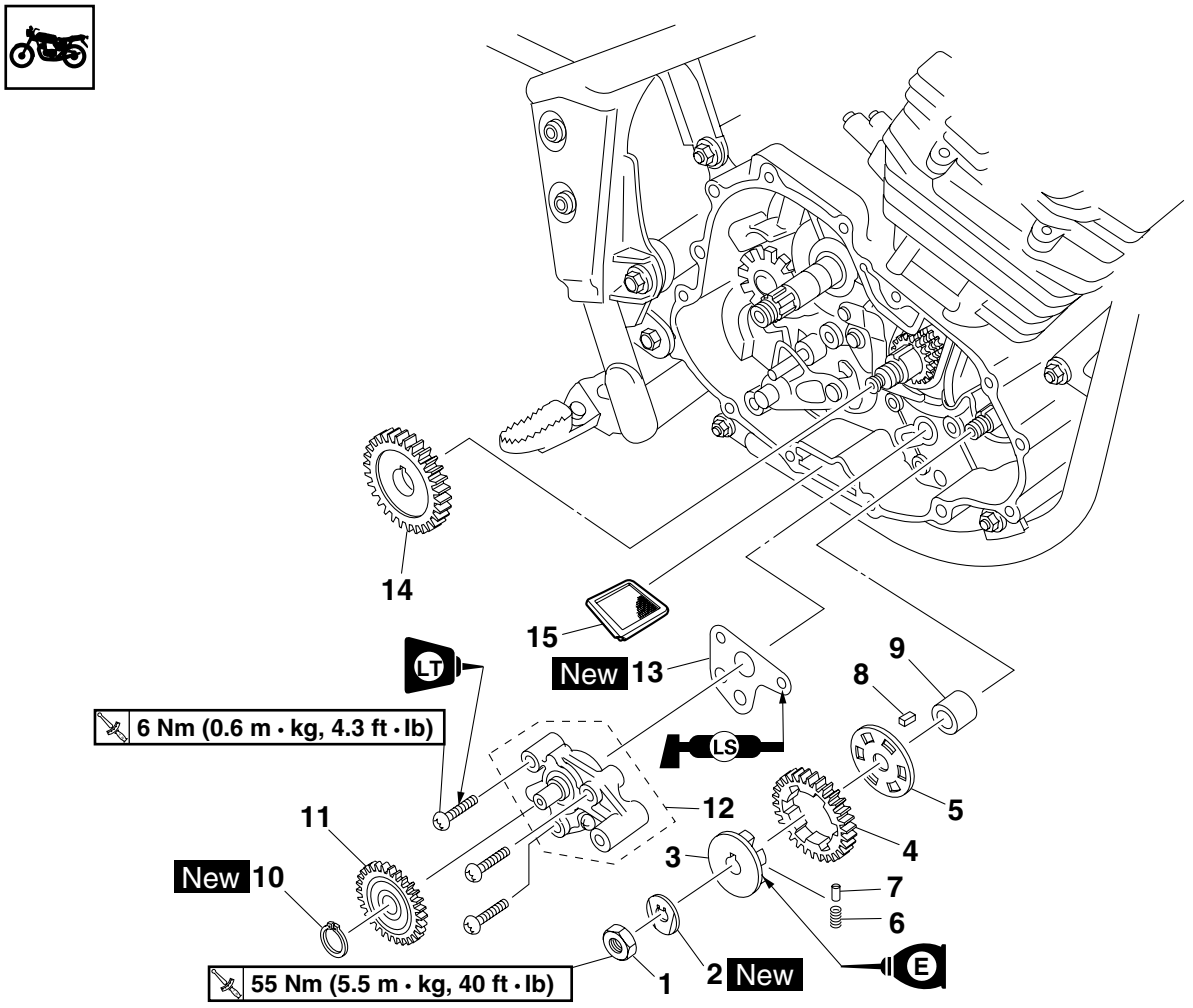


12.Adjust:
- Clutch cable free play
  Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” on page 3-12.

EAS3C51007

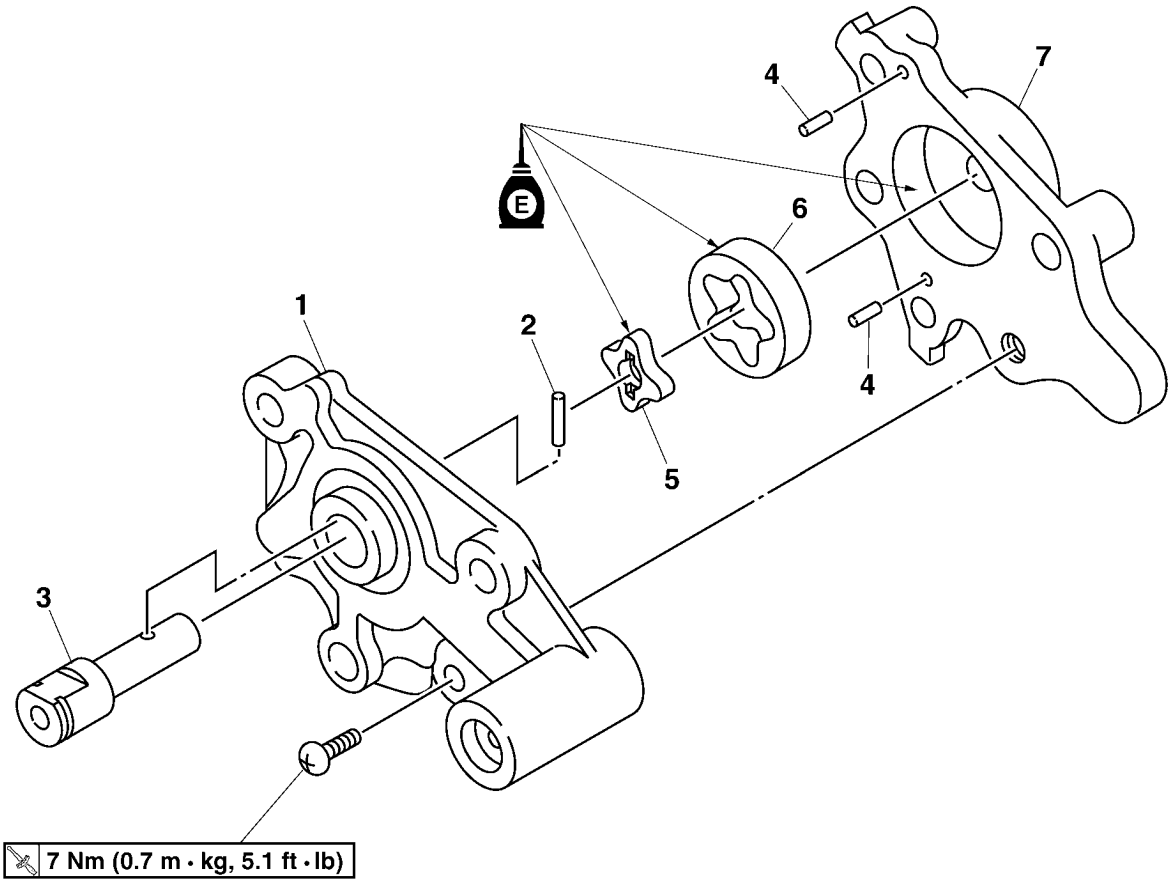
OIL PUMP AND BALANCER GEAR

Removing oil pump and balancer gear



Order	Job/Part	Q'ty	Remarks
	Primary drive gear		Refer to "CLUTCH" on page 5-30.
1	Balancer driven gear nut	1	
2	Lock washer	1	
3	Buffer boss	1	
4	Balancer driven gear	1	
5	Absorber plate	1	
6	Spring	6	
7	Dowel pin	3	
8	Straight key	1	
9	Spacer	1	
10	Circlip	1	
11	Oil pump driven gear	1	
12	Oil pump assembly	1	
13	Oil pump gasket	1	
14	Balancer drive gear	1	
15	Oil strainer	1	
			For installation, reverse the removal procedure.

Disassembling the oil pump



Order	Job/Part	Q'ty	Remarks
1	Oil pump cover	1	
2	Dowel pin	1	
3	Oil pump shaft	1	
4	Dowel pin	2	
5	Inner rotor	1	
6	Outer rotor	1	
7	Oil pump housing	1	
			For assembly, reverse the disassembly procedure.

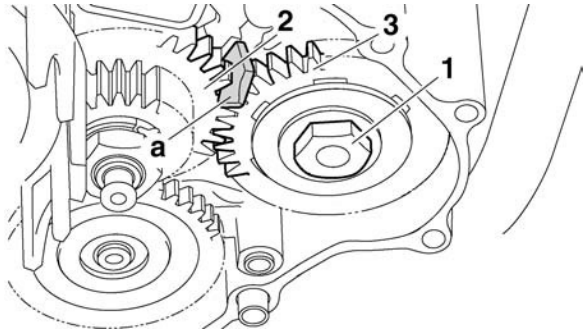
EAS3C51008

REMOVING THE BALANCER GEAR

1. Straighten the lock washer tab.
2. Loosen:
   - Balancer driven gear unit “1”

NOTE:

Insert aluminum plate “a” between balancer drive gear “2” and balancer driven gear “3”, and loosen the balancer driven gear nut.



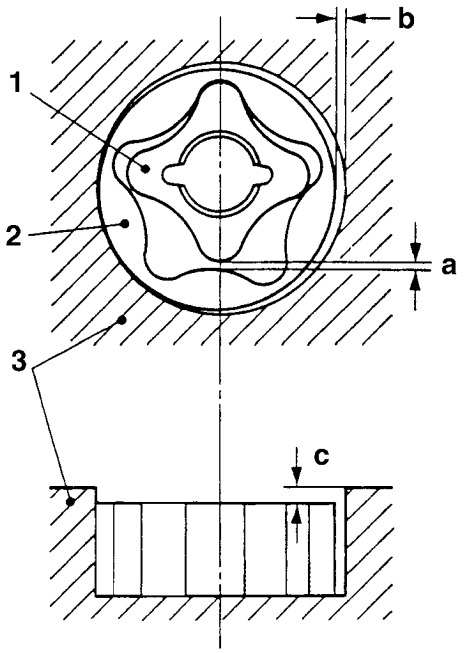
3. Remove:
   - Balancer drive gear
     Refer to “CLUTCH” on page 5-30.

EAS24960

CHECKING THE OIL PUMP

1. Check:
   - Oil pump driven gear
   - Oil pump housing
   - Oil pump housing cover
     Cracks/damage/wear → Replace the defective part(s).
2. Measure:
   - Inner-rotor-to-outer-rotor-tip clearance “a”
   - Outer-rotor-to-oil-pump-housing clearance “b”
   - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance “c”
     Out of specification → Replace the oil pump.

Inner-rotor-to-outer-rotor-tip clearance
0.150 mm (0.0059 in)
Limit
0.200 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance
0.100–0.151 mm (0.0039–0.0059 in)
Limit
0.221 mm (0.0087 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance
0.04–0.09 mm (0.0016–0.0035 in)
Limit
0.16 mm (0.0063 in)



1. Inner rotor
2. Outer rotor
3. Oil pump housing

3. Check:
   - Oil pump operation
     Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

EAS24990

CHECKING THE OIL STRAINER

1. Check:
   - Oil strainer
     Damage → Replace.
     Contaminants → Clean with solvent.

EAS25000
ASSEMBLING THE OIL PUMP

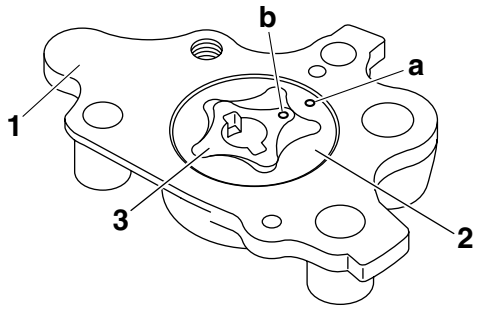
1. Lubricate:
   - Inner rotor
   - Outer rotor
   - Oil pump shaft
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

2. Install:
   - Oil pump housing “1”
   - Dowel pin
   - Outer rotor “2”
   - Inner rotor “3”

NOTE:

Align outer rotor mark “a” with inner rotor mark “b” and assemble them in the oil pump housing.



3. Install:
   - Oil pump cover
   - Oil pump shaft
   - Dowel pin

	Oil pump cover screw **7 Nm (0.7 m•kg, 5.1 ft•lb)**

NOTE:

When installing the oil pump cover, align the dowel pin of oil pump shaft with the inner rotor slot.

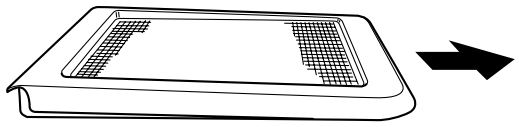
4. Check:
   - Oil pump operation
     Refer to “CHECKING THE OIL PUMP” on page 5-40.

EAS3C51009
INSTALL THE OIL PUMP AND BALANCER GEAR

1. Install:
   - Oil strainer

NOTE:

Assemble the oil strainer in the crankcase in the arrow direction as shown.



2. Install:
   - Balancer drive gear

NOTE:

Direct the balancer drive gear mark outward of the vehicle during assembling.

3. Install:
   - Oil pump gasket New
   - Oil pump

	Oil pump bolt **26 Nm (2.6 m•kg, 19 ft•lb)**

ECA13890

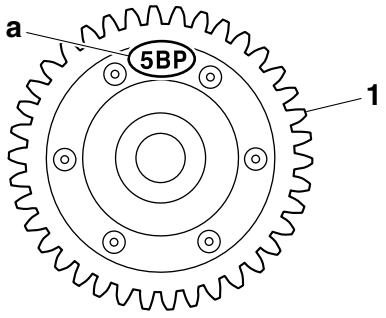
CAUTION:

After tightening the bolts, make sure the oil pump turns smoothly.

4. Install:
   - Oil pump driven gear “1”

NOTE:

Direct stamp “a” of the oil pump driven gear outward of the vehicle.

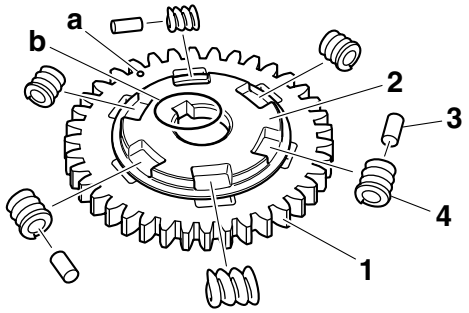


5. Install:
   - Balancer driven gear “1”
   - Buffer boss “2”
   - Dowel pin “3”
   - Spring “4”
     (To driven gear)

NOTE:

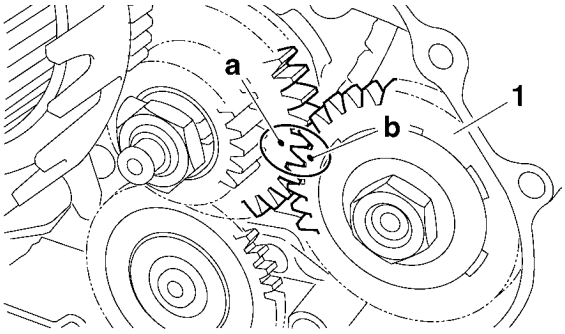
- Align mark “a” of the balancer driven gear with slot “b” of the buffer boss.

- Assemble the dowel pin on the spring as shown.



6. Install:
   - Balancer driven gear “1”
   - Lock washer New
   - Balancer driven gear nut

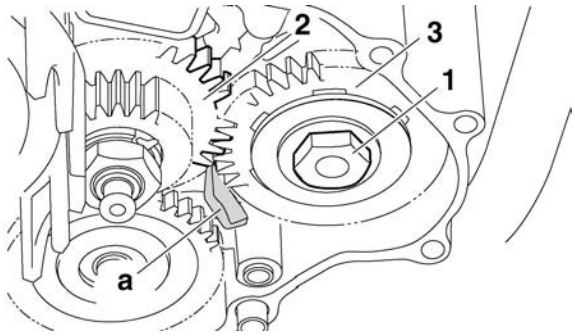
NOTE:
Align mark “a” of the balancer drive gear with mark “b” of the balancer driven gear.



7. Tighten:
   - Primary drive gear nut
     Refer to “CLUTCH” on page 5-30.
8. Tighten:
   - Balancer driven gear nut “1”

	Balancer driven gear nut **55 Nm (5.5 m•kg, 40 ft•lb)**

NOTE:
Insert aluminum plate “a” between balancer drive gear “2” and balancer driven gear “3”, and tighten the balancer driven gear nut.

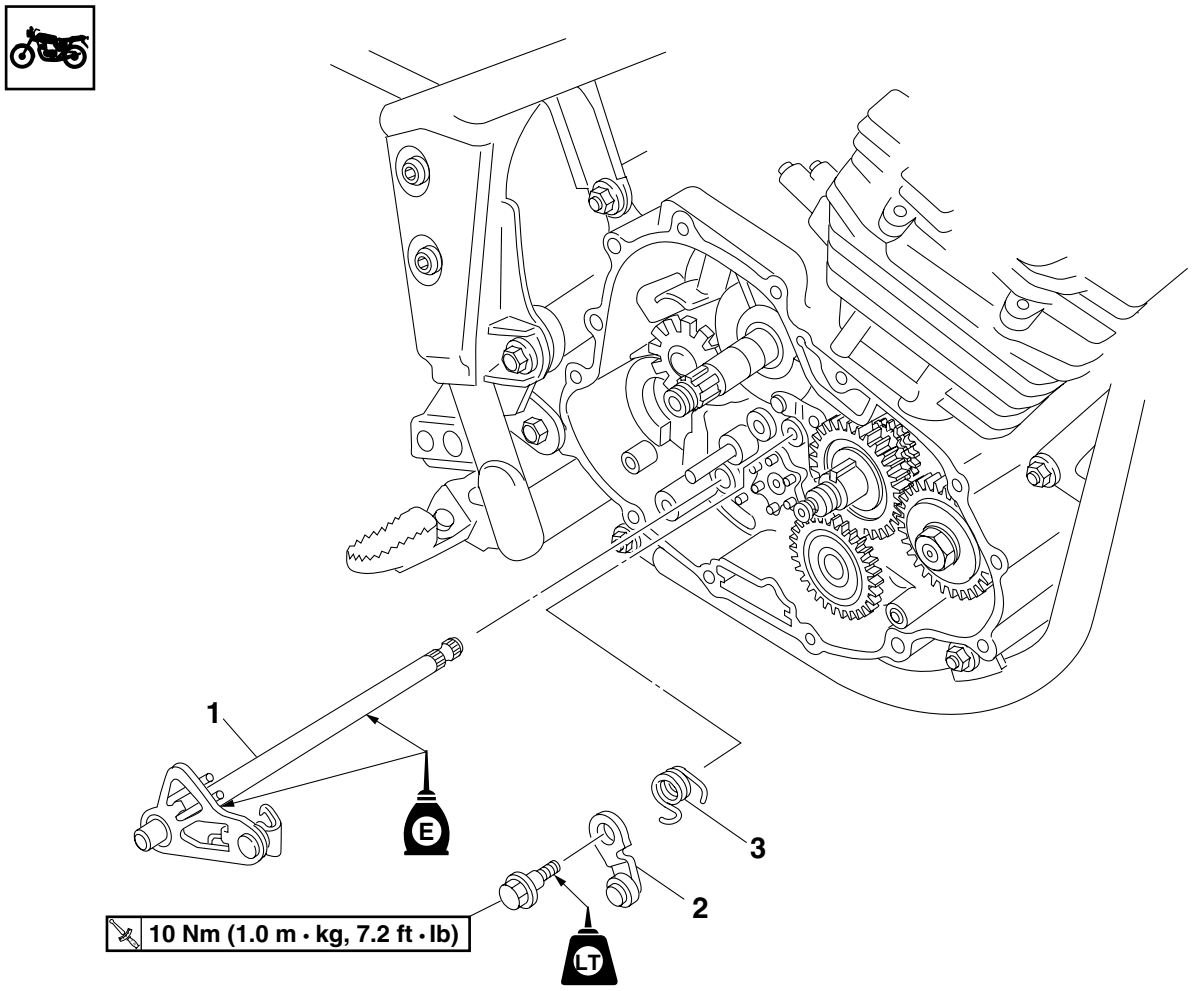


9. Be sure to bend the lock washer tab along to the nut side face.

EAS25410

SHIFT SHAFT

Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Shift pedal assembly		Refer to "ENGINE REMOVAL" on page 5-1.
	Clutch housing		Refer to "CLUTCH" on page 5-30.
1	Shift shaft assembly	1	
2	Stopper lever	1	
3	Stopper lever spring	1	
			For installation, reverse the removal procedure.

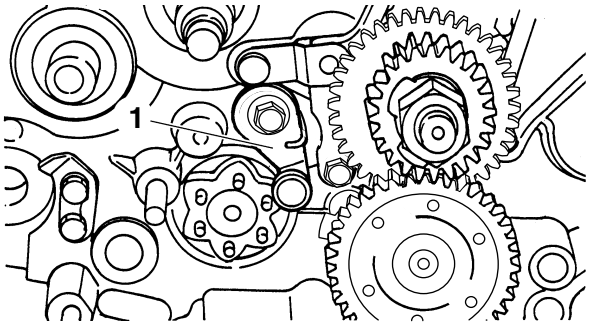
EAS25420
CHECKING THE SHIFT SHAFT
1. Check:
   - Shift shaft
   - Shift lever
     Bends/damage/wear → Replace.
   - Shift lever spring
     Damage/wear → Replace.

EAS25430
CHECKING THE STOPPER LEVER
1. Check:
   - Stopper lever
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.

EAS25450
INSTALLING THE SHIFT SHAFT
1. Install:
   - Stopper lever “1”
   - Stopper lever spring

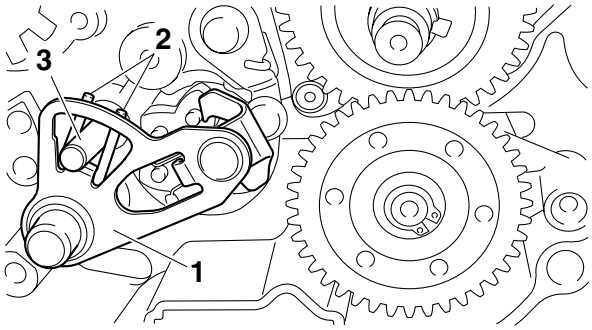
	**Stopper lever bolt** **10 Nm (1.0 kg•m)** **Apply locking agent (LOCTITE®)**

NOTE:
- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.



2. Install:
   - Shift shaft assembly “1”

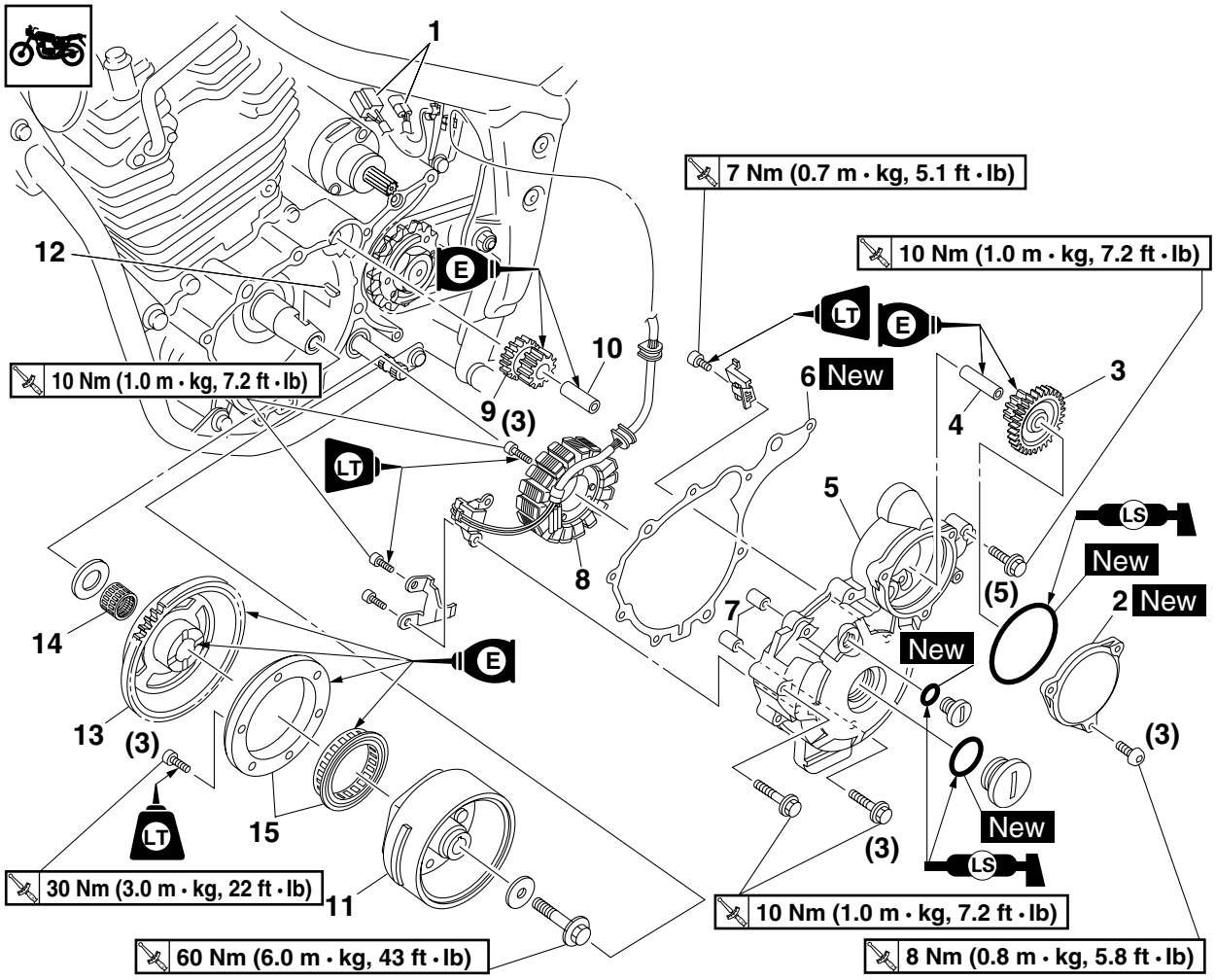
NOTE:
Align shaft spring “2” with stopper “3” and assemble the shift shaft assembly.



EAS3C51010

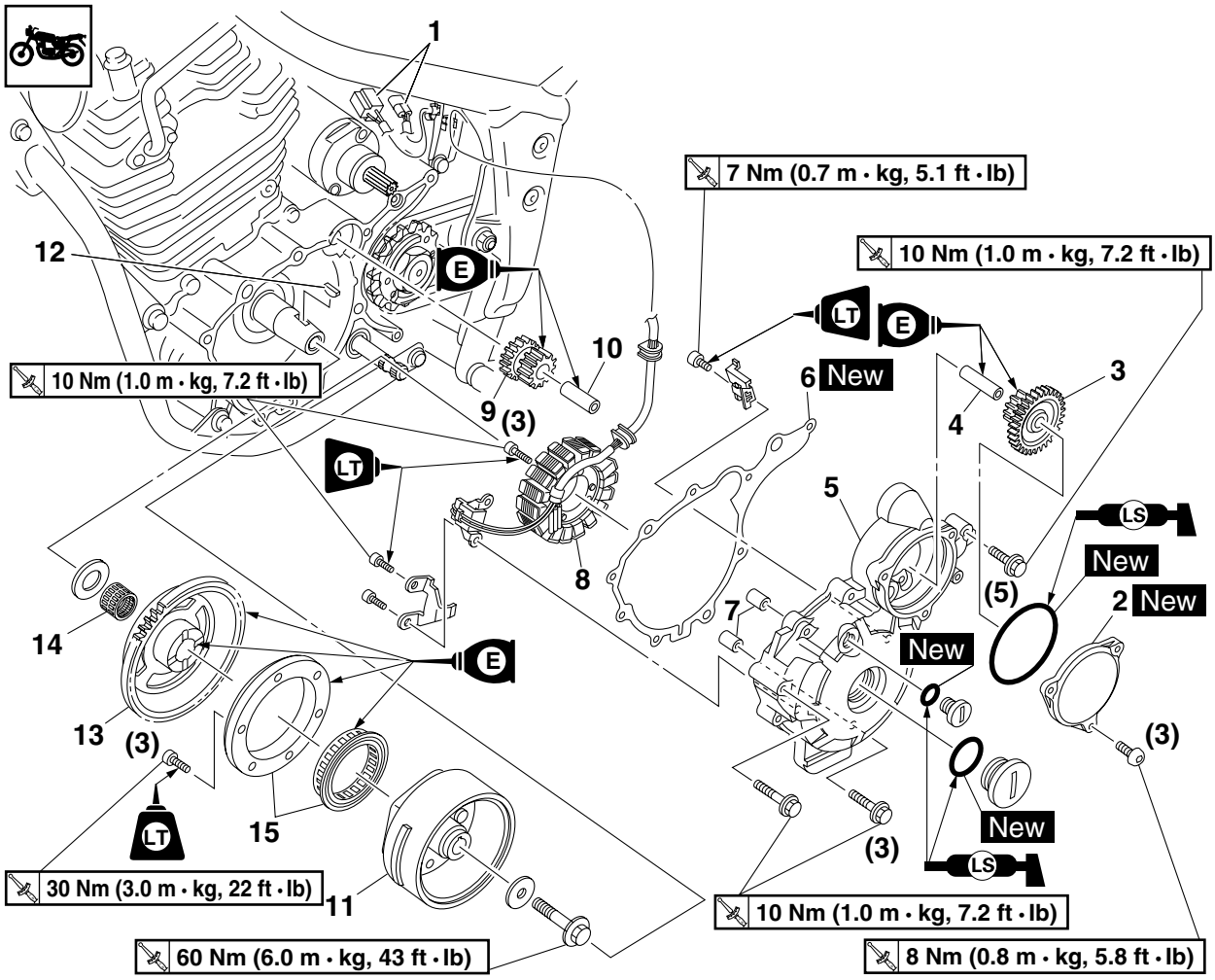
GENERATOR AND STARTER CLUTCH

Removing the generator rotor and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Drain the engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Rear left side cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Drive sprocket cover		Refer to "CHAIN DRIVE" on page 4-57.
	Shift pedal assembly		Refer to "ENGINE REMOVAL" on page 5-1.
1	Pickup coil coupler/stator assembly coupler	1/1	Disconnect.
2	Starter clutch Idle gear cover	1	
3	Starter clutch idle gear1	1	
4	Starter clutch idle gear shaft1	1	
5	Generator rotor cover	1	
6	Generator rotor cover gasket	1	
7	Dowel pin	2	
8	Stator assembly	1	
9	Starter clutch idle gear2	1	
10	Starter clutch idle gear shaft2	1	
11	Generator rotor	1	
12	Woodruff key	1	
13	Starter clutch gear	1	

Removing the generator rotor and starter clutch

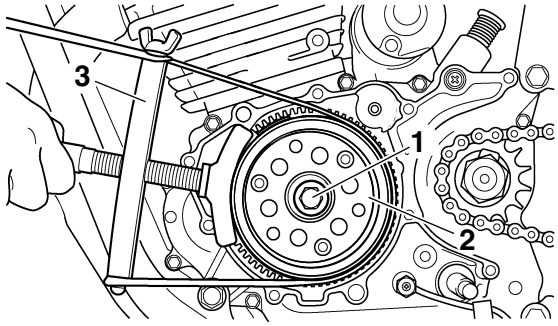


Order	Job/Parts to remove	Q'ty	Remarks
14	Bearing	1	
15	Starter clutch	1	
			For installation, reverse the removal procedure.

EAS24490
REMOVING THE GENERATOR
1. Remove:
   - Generator rotor bolt “1”
   - Washer

NOTE:
- While holding the generator rotor “2” with the sheave holder “3”, loosen the generator rotor bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

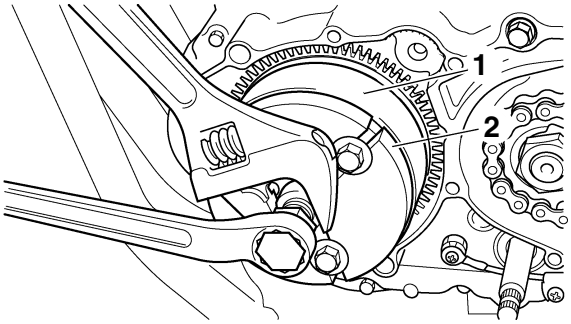


2. Remove:
   - Generator rotor “1”
     (with the flywheel puller “2”)
   - Woodruff key

ECA13880
CAUTION:
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set center bolt and the crankshaft.

NOTE:
Make sure the flywheel puller is centered over the generator rotor.

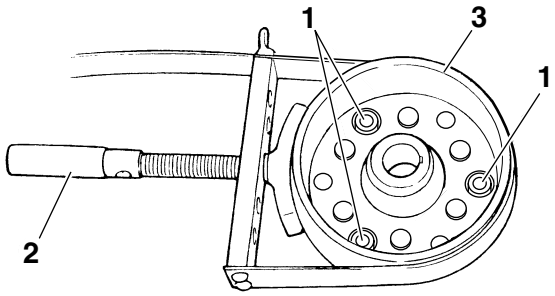
Flywheel puller
90890-01362
Heavy duty puller
YU-33270-B



EAS24560
REMOVING THE STARTER CLUTCH
1. Remove:
   - Starter clutch bolt “1”

NOTE:
- While holding the generator rotor “3” with the sheave holder “2”, remove the starter clutch bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



EAS24570
CHECKING THE STARTER CLUTCH
1. Check:
   - Starter clutch rollers
     Damage/wear → Replace.
2. Check:
   - Starter clutch idle gear 1, 2
   - Starter clutch gear
     Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
   - Starter clutch gear’s contacting surfaces
     Damage/pitting/wear → Replace the starter clutch gear.
4. Check:
   - Starter clutch operation

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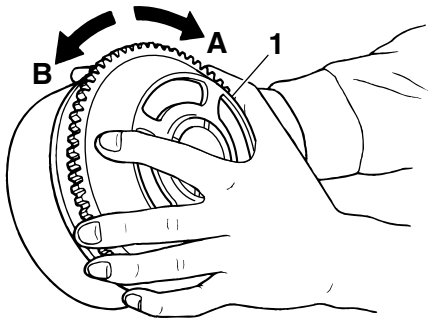
a. Install the starter clutch gear “1” onto the starter clutch and hold the starter clutch.
b. When turning the starter clutch gear clockwise “A”, the starter clutch and the starter clutch gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter clutch drive gear counterclockwise “B”, it should turn freely, otherwise the starter clutch is faulty and must be replaced.



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EAS24600

INSTALLING THE STARTER CLUTCH

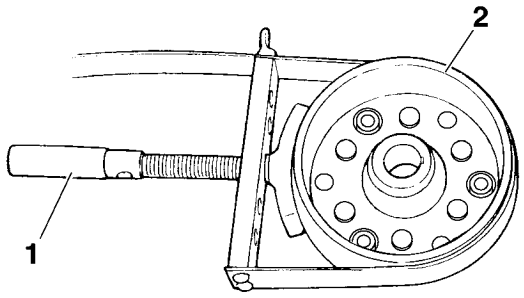
1. Install:
   - Starter clutch

	**Starter clutch bolt** **30 Nm (3.0 m•kg, 22 ft•lb)** **Apply locking agent (LOCTITE®)**

NOTE:

- While holding the generator rotor “2” with the sheave holder “1”, tighten the starter clutch bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

	**Sheave holder** **90890-01701** **Primary clutch holder** **YS-01880-A**



EAS24500

INSTALLING THE GENERATOR

1. Install:
   - Woodruff key
   - Generator rotor
   - Washer
   - Generator rotor bolt

NOTE:

- Clean the tapered portion of the crankshaft and the generator rotor hub.
- When installing the generator rotor, make sure the woodruff key is properly sealed in the keyway of the crankshaft.

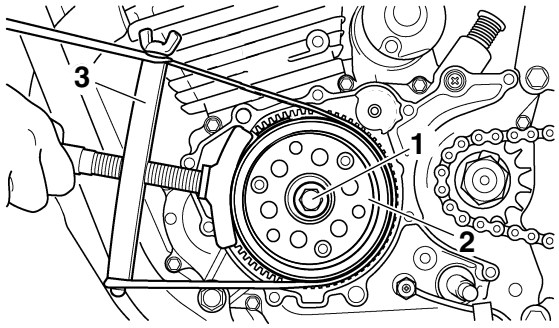
2. Tighten:
   - Generator rotor bolt “1”

	**Generator rotor bolt** **60 Nm (6.0 m•kg, 43 ft•lb)**

NOTE:

- While holding the generator rotor “2” with the sheave holder “3”, tighten the generator rotor bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

	**Sheave holder** **90890-01701** **Primary clutch holder** **YS-01880-A**



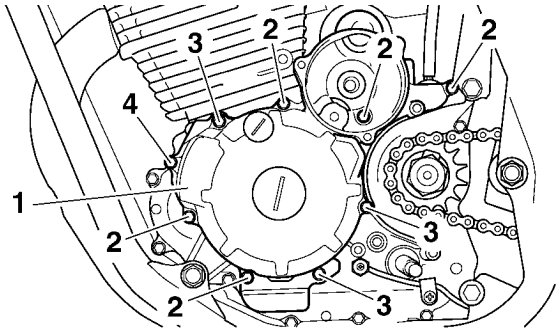
3. Install:
   - Generator rotor cover “1”

	Generator rotor cover bolt **10 Nm (1.0 m•kg, 7.2 ft•lb)**

NOTE:

Tighten the bolts diagonally.

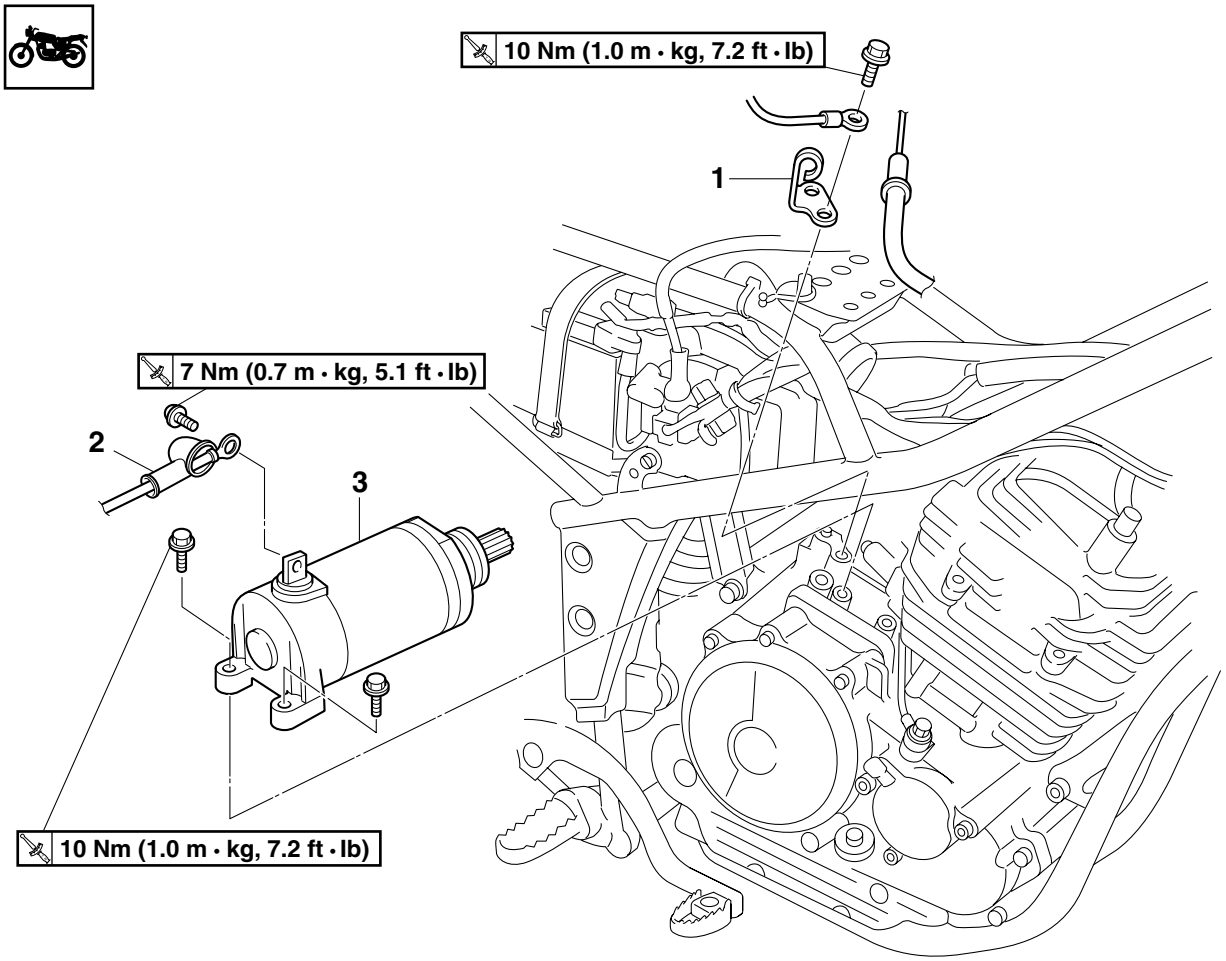
- M6 × 30 mm bolt "2"
- M6 × 40 mm bolt "3"
- M6 × 45 mm bolt "4"



EAS24780

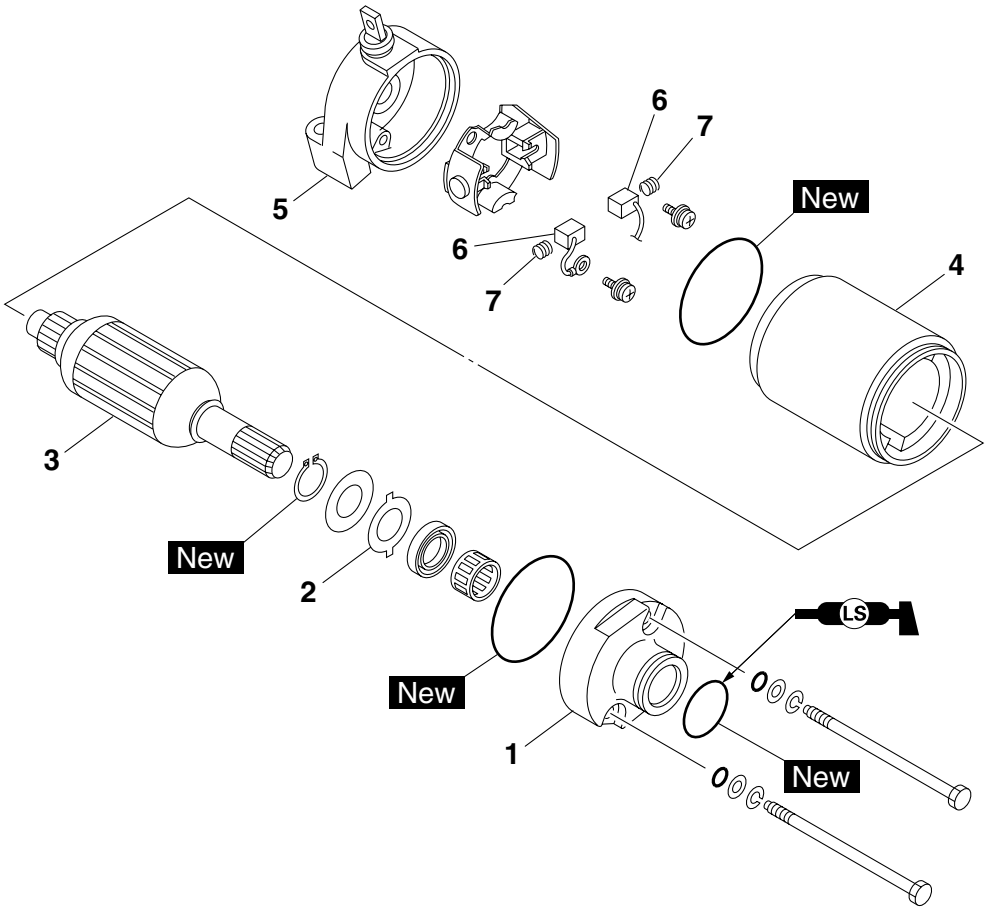
ELECTRIC STARTER

Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Carburetor		Refer to "CARBURETOR" on page 6-3.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-1.
1	Clutch cable holder	1	
2	Starter motor lead	1	Disconnect.
3	Starter motor	1	
			For installation, reverse the removal procedure.

Disassembling the starter motor

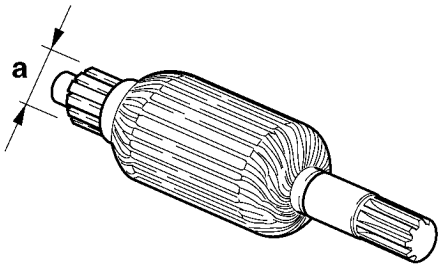


Order	Job/Parts to remove	Q'ty	Remarks
1	Starter motor front cover	1	
2	Lock washer	1	
3	Armature assembly	1	
4	Starter motor yoke	1	
5	Starter motor rear cover	1	
6	Brush	2	
7	Brush spring	2	
			For assembly, reverse the disassembly procedure.

EAS24790
CHECKING THE STARTER MOTOR

1. Check:
   - Commutator
     Dirt → Clean with 600 grit sandpaper.
2. Measure:
   - Commutator diameter “a”
     Out of specification → Replace the starter motor.

	Limit **21.0 mm (0.83 in)**



3. Measure:
   - Mica undercut “a”
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

	Mica undercut (depth) **1.50 mm (0.06 in)**

NOTE:
The mica of the commutator must be undercut to ensure proper operation of the commutator.

4. Measure:
   - Armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

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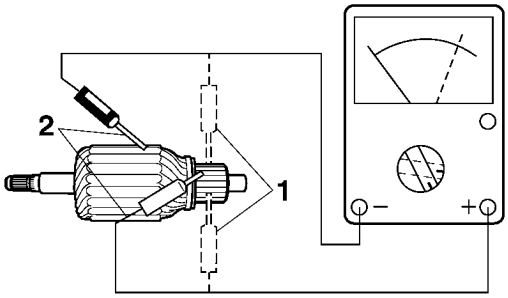
a. Measure the armature assembly resistances with the pocket tester.

	Pocket tester **90890-03132**

	Armature coil **Commutator resistance “1”** **0.0126–0.0154 Ω at 20°C (68°F)** **Insulation resistance “2”** **Above 1 MΩ at 20°C (68°F)**

b. If any resistance is out of specification, replace the starter motor.



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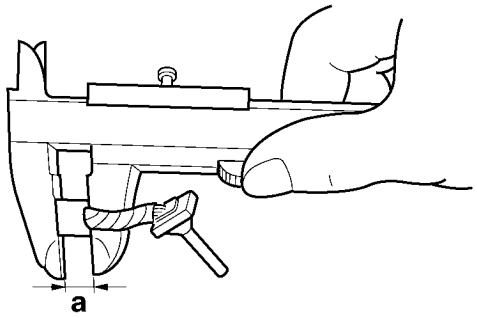
5. Measure:
   - Brush length “a”
     Out of specification → Replace the brushes as a set.

	Limit **3.50 mm (0.14 in)**



6. Measure:
   - Brush spring force
     Out of specification → Replace the brush springs as a set.

	Brush spring force **5.52–8.28 N (19.87–29.80 oz) (563–844 gf)**

7. Check:

- Gear teeth
  Damage/wear → Replace the gear.

8. Check:
   - Bearing
   - Oil seal
     Damage/wear → Replace the defective part(s).

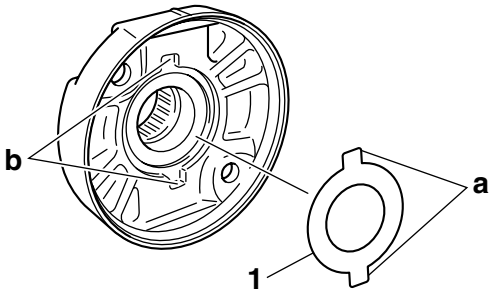
EAS24800

ASSEMBLING THE STARTER MOTOR

1. Install:
   - Lock washer “1”

NOTE:

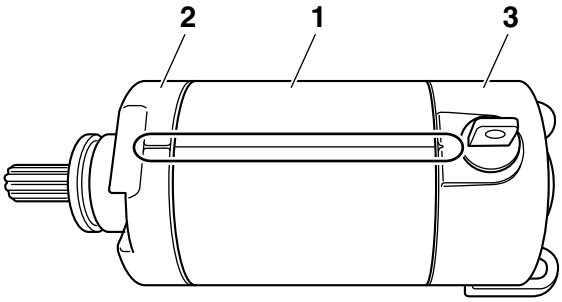
Align the tab “a” on the brush seat with the slot “b” in the starter motor rear cover.



2. Install:
   - Starter motor yoke “1”
   - Starter motor front cover “2”
   - Starter motor rear cover “3”

NOTE:

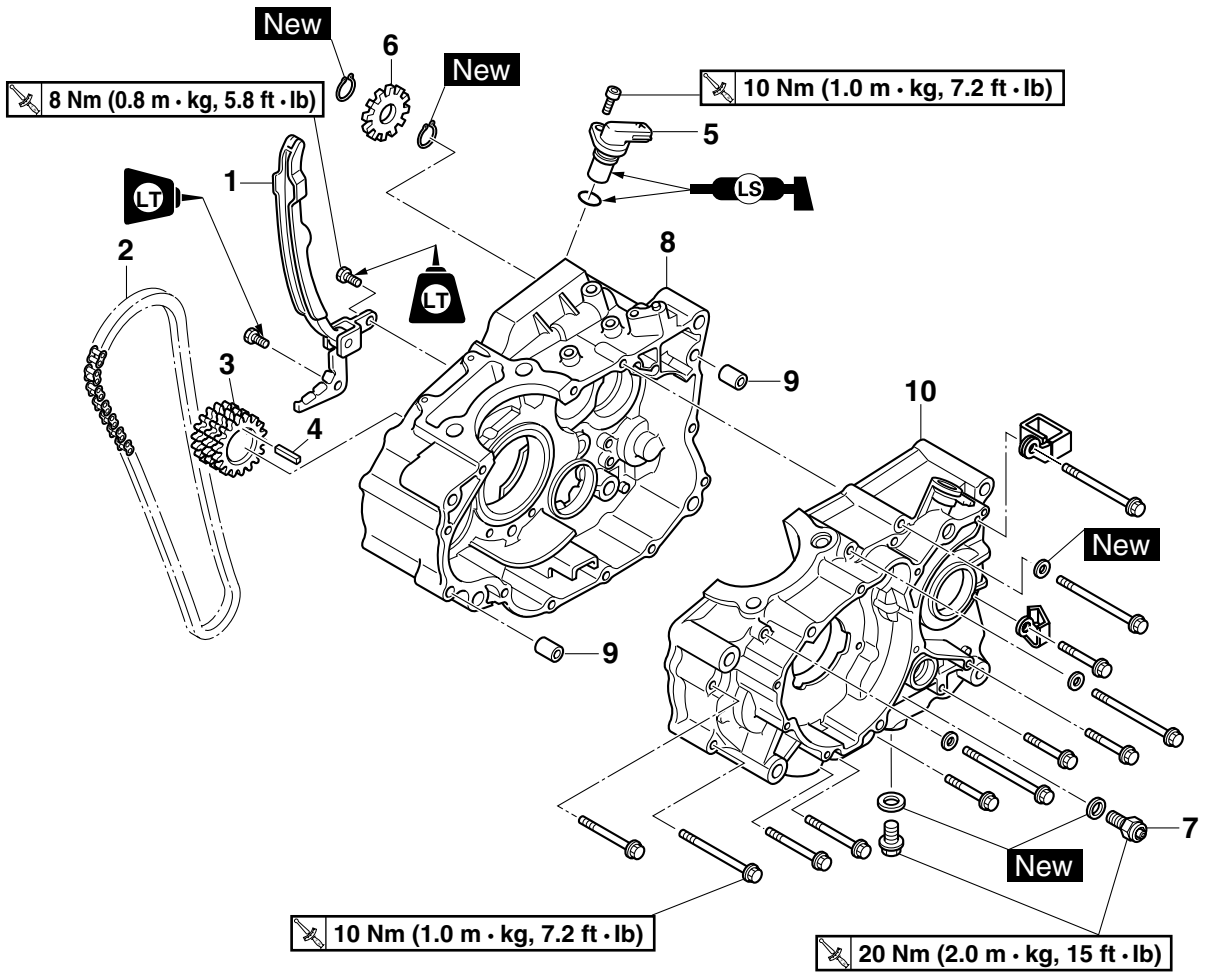
Align the match marks on the starter motor yoke with the match marks on the front and starter motor rear covers.



EAS25540

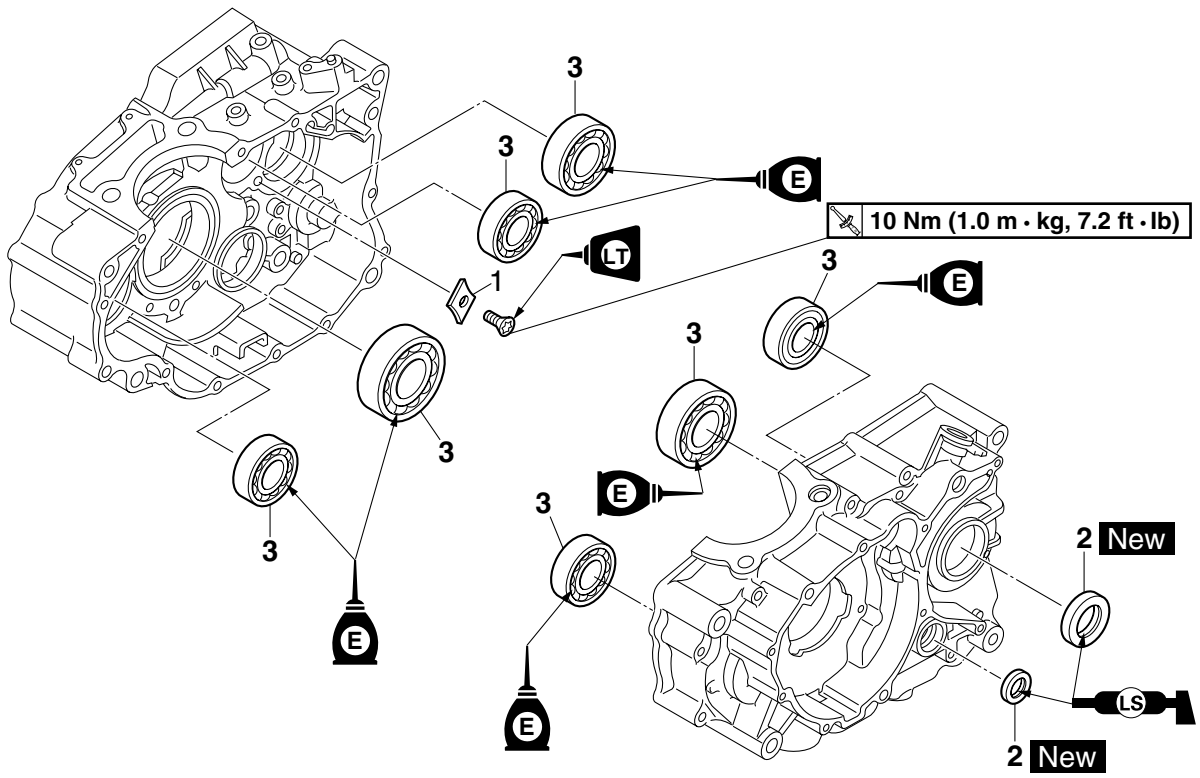
CRANKCASE

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
	Piston		Refer to "CYLINDER AND PISTON" on page 5-25.
	Balancer drive gear		Refer to "OIL PUMP AND BALANCER GEAR" on page 5-38.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-43.
	Generator rotor		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-45.
1	Timing chain guide (intake side)	1	
2	Timing chain	1	
3	Crankshaft sprocket	1	
4	Straight key	1	
5	Speed sensor	1	
6	Speed sensor rotor	1	
7	Neutral switch	1	
8	Right crankcase	1	
9	Dowel pin	2	
10	Left crankcase	1	
			For installation, reverse the removal procedure.

Removing the Bearing



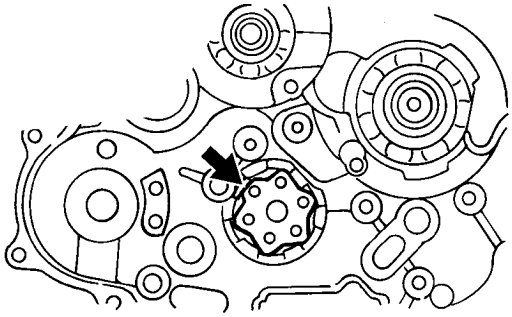
Order	Job/Parts to remove	Q'ty	Remarks
	Crankshaft assembly		Refer to "CRANKSHAFT ASSEMBLY" on page 5-58.
	Main axle assembly/Drive axle assembly		Refer to "TRANSMISSION" on page 5-61.
1	Bearing retainer	1	
2	Oil seal	2	
3	Bearing	7	
			For installation, reverse the removal procedure.

EAS25570
DISASSEMBLING THE CRANKCASE
1. Remove:
   • Crankcase bolts

NOTE:
Loosen each bolt 1/4 of a turn at a time, in two stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

2. Turn:
   • Shift drum segment

NOTE:
Turn the shift drum segment to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase separation.



3. Remove:
   • Right crankcase

EC3C51004
CAUTION:
- **Tap on one side the crankcase with a soft-face hammer. Tap only reinforced portions of the crankcase.**
- **Do not damage the crankcase mating surfaces.**
- **Remove the crankcase right halves first.**

EAS25580
CHECKING THE CRANKCASE
1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
   • Crankcase
   Cracks/damage → Replace.
   Obstruction → Blow out with compressed air.

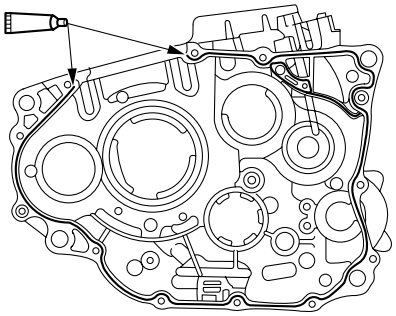
EAS3C51011
CHECKING THE TIMING CHAIN, CRANKSHAFT SPROCKET, TIMING CHAIN GUIDE (INTAKE SIDE)
1. Check:
   • Timing chain
   Crack/stiffness → Replace the camshaft sprocket, timing chain, and crankshaft sprocket as a set.
2. Check:
   • Crankshaft sprocket
   Refer to "CYLINDER HEAD" on page 5-6.
3. Check:
   • Timing chain guide (intake side)
   Damage/wear → Replace.

EAS3C51012
CHECKING THE BEARING AND OIL SEAL
1. Check:
   • Bearing
   Abnormal sound/rough movement/looseness → Replace.
2. Check:
   • Oil seal
   Damage/wear → Replace.

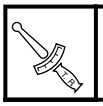
EAS25700
ASSEMBLING THE CRANKCASE
1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
   • Sealant
   (onto the crankcase mating surfaces)

	**Yamaha bond No. 1215 (Three Bond No.1215®)** **90890-85505**

NOTE:
Do not allow any sealant to come into contact with the oil gallery.



3. Install:
   • Right crankcase
   (to the left crankcase)

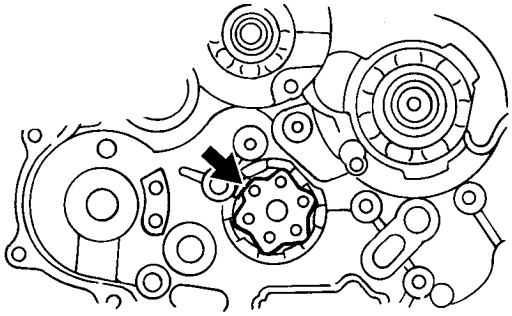
	**Crankcase bolt** **10 Nm (1.0 m•kg, 7.2 ft•lb)**

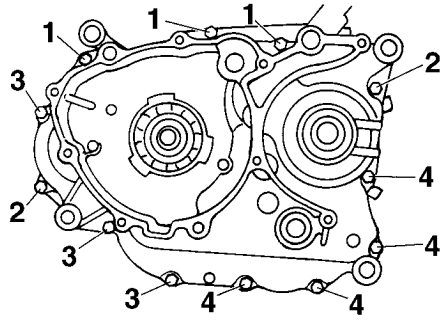
NOTE:
- Turn the shift drum segment as shown so that the shift drum segment teeth do not contact the

crankcase during its assembling.

- Tighten the bolts diagonally in two (2) stages, with 1/4 turn each.

- M6 × 70 mm bolt (with gasket)"1"
- M6 × 60 mm bolt "2"
- M6 × 55 mm bolt "3"
- M6 × 45 mm bolt "4"

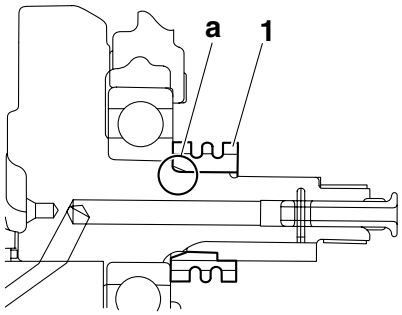




4. Install:
   - Crankshaft sprocket "1"

NOTE:

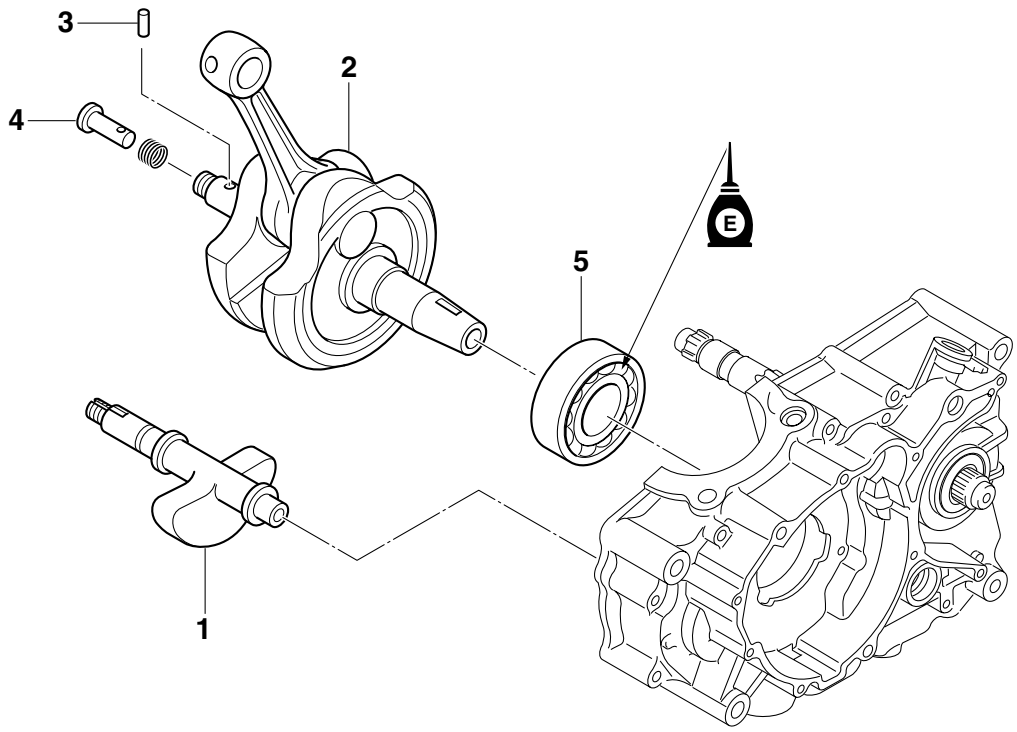
Assemble the crankshaft sprocket by facing its chamfered side "a" toward the crankcase.



EAS3C51013

CRANKSHAFT ASSEMBLY

Crankshaft assembly and balancer



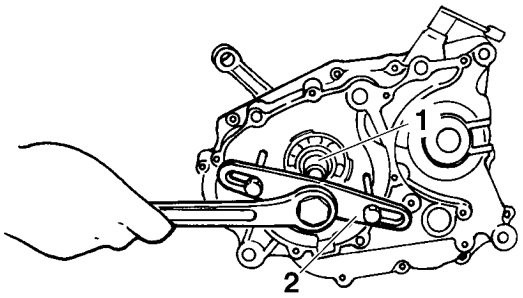
Order	Job/Part	Q'ty	Remarks
	Separate the crank case.		Refer to "CRANKCASE" on page 5-54.
1	Balancer	1	
2	Crankshaft assembly	1	
3	Dowel pin	1	
4	Plunger pin	1	
5	Bearing	1	
			For installation, reverse the removal procedure.

EAS26000
REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
   - Crankshaft assembly “1”

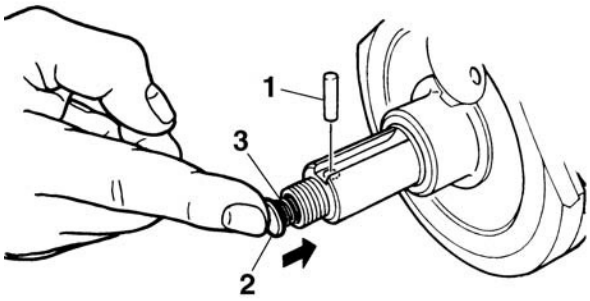
NOTE:
Remove the crankshaft assembly using crankshaft separating tool “2”.

Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B



2. Remove:
   - Dowel pin “1”
   - Plunger pin “2”
   - Spring “3”

NOTE:
Slightly press the plunger pin and pull out the dowel pin. Then, remove the plunger pin and the spring.

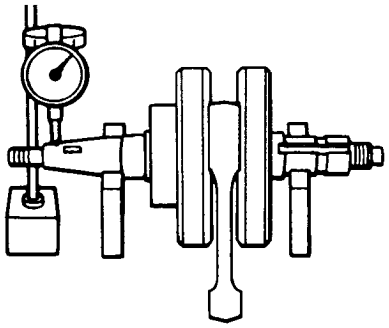


EAS3C51014
CHECKING THE CRANKSHAFT AND CONNECTING ROD

1. Measure:
   - Crankshaft runout
     Out of specification → Replace the crankshaft assembly, bearing or both.

NOTE:
Turn the crankshaft slowly.

Runout limit C
0.030 mm (0.0012 in)



2. Measure:
   - Big end side clearance
     Out of specification → Replace the crankshaft assembly.

Big end side clearance D
0.350–0.850 mm (0.0138–0.0335 in)

3. Measure:
   - Crankshaft width
     Out of specification → Replace the crankshaft assembly.

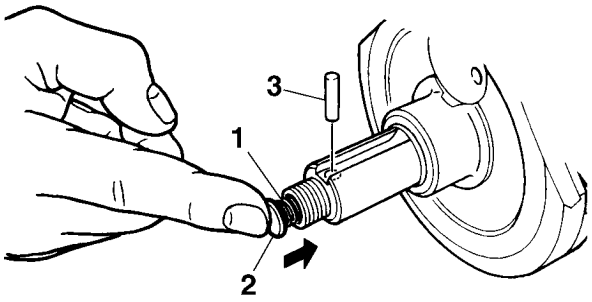
Width A
69.25–69.30 mm (2.726–2.728 in)

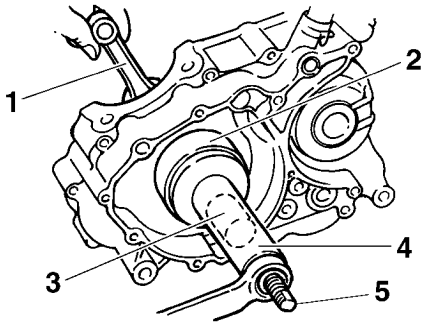
4. Check:
   - Bearing
     Cracks/damage/wear → Replace the crankshaft assembly.
5. Check:
   - Crankshaft journal oil passage
     Obstruction → Blow out with compressed air.

EAS26210
INSTALLING THE CRANKSHAFT ASSEMBLY

1. Install:
   - Spring “1”
   - Plunger pin “2”
   - Dowel pin “3”

NOTE:
Press the plunger pin by your fingers, and make sure that it operates smoothly.





2. Install:
   • Crankshaft assembly “1”

NOTE:

Install the crankshaft assembly using spacer “2”, adapter (M10) “3”, crankshaft installer “4”, and crankshaft installer bolt “5”.

Crankshaft installer pot
90890-01274
Installing pot
YU-90058
Crankshaft installer bolt
90890-01275
Bolt
YU-90060
Adapter (M10)
90890-01383
Adapter #2
YU-90062
Spacer
90890-01288

ECA13970

CAUTION:

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

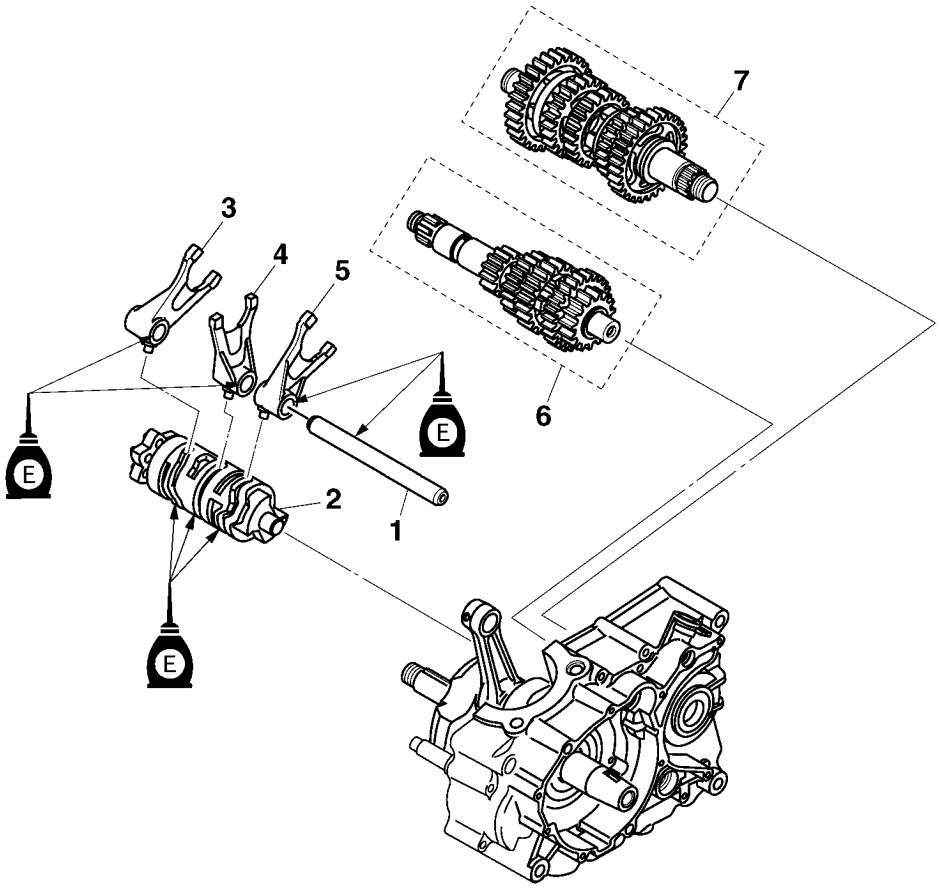
NOTE:

Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft assembly bottoms against the bearing.

EAS26241

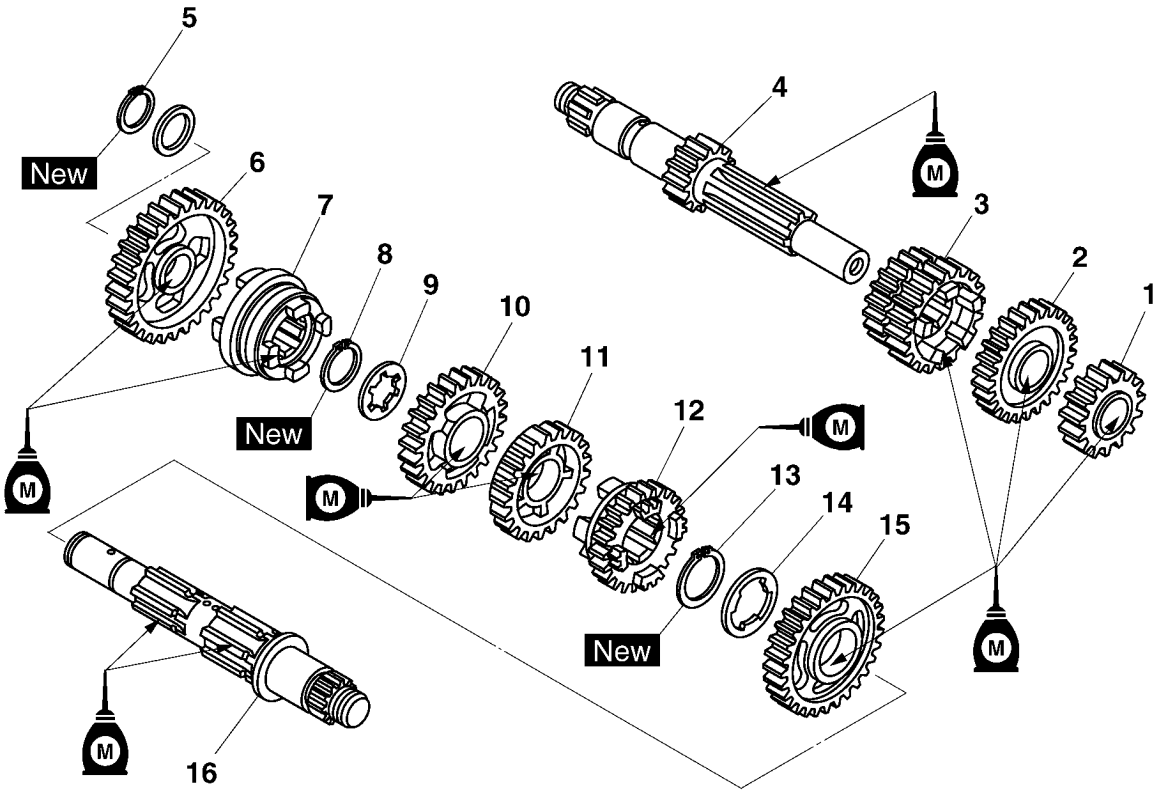
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



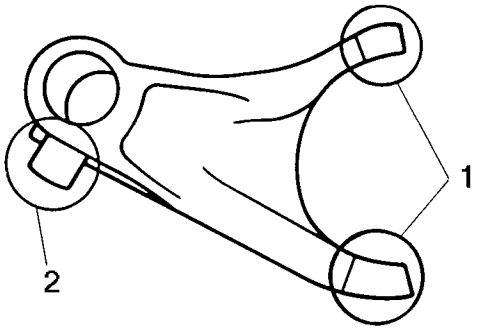
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase separation		Refer to "CRANKCASE" on page 5-54.
1	Shift fork guide bar	1	
2	Shift drum assembly	1	
3	Shift fork-R	1	
4	Shift fork-C	1	
5	Shift fork-L	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
			For installation, reverse the removal procedure.

Disassembling the transmission



Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	5th pinion gear	1	
3	3rd/4th pinion gear	1	
4	Main axle/1st pinion gear	1	
5	Circlip	1	
6	1st wheel gear	1	
7	Dog clutch	1	
8	Circlip	1	
9	Lock washer	1	
10	3rd wheel gear	1	
11	4th wheel gear	1	
12	5th wheel gear	1	
13	Circlip	1	
14	Lock washer	1	
15	2nd wheel gear	1	
16	Drive axle	1	
			For assembly, reverse the disassembly procedure.

EAS26260
CHECKING THE SHIFT FORKS
The following procedure applies to all of the shift forks.
1. Check:
   - Shift fork cam follower "1"
   - Shift fork pawl "2"
     Bends/damage/scoring/wear → Replace the shift fork.

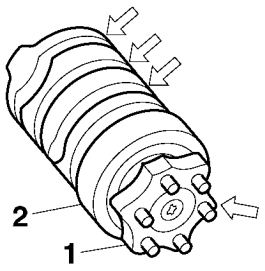


2. Check:
   - Shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

EWA12840
WARNING
Do not attempt to straighten a bent shift fork guide bar.

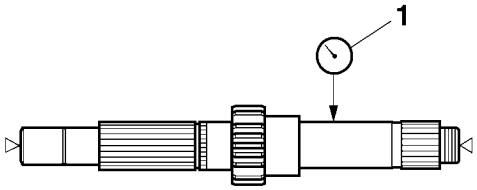
3. Check:
   - Shift fork movement
     (along the shift fork guide bar)
     Rough movement → Replace the shift forks and shift fork guide bar as a set.

EAS26270
CHECKING THE SHIFT DRUM ASSEMBLY
1. Check:
   - Shift drum groove
     Damage/scratches/wear → Replace the shift drum assembly.
   - Shift drum segment "1"
     Damage/wear → Replace the shift drum assembly.
   - Shift drum bearing "2"
     Damage/pitting → Replace the shift drum assembly.



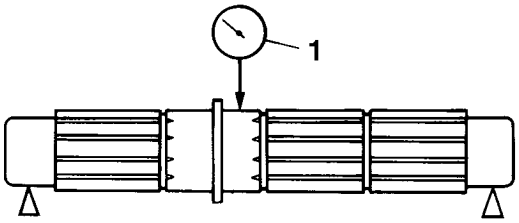
EAS26290
CHECKING THE TRANSMISSION
1. Measure:
   - Main axle runout
     (with a centering device and dial gauge "1")
     Out of specification → Replace the main axle.

	Main axle runout limit **0.08 mm (0.0032 in)**



2. Measure:
   - Drive axle runout
     (with a centering device and dial gauge "1")
     Out of specification → Replace the drive axle.

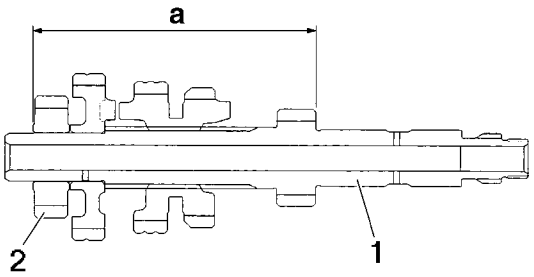
	Drive axle runout limit **0.08 mm (0.0032 in)**



3. Check:
   - Transmission gears
     Blue discoloration/pitting/wear → Replace the defective gear(s).
   - Transmission gear dogs
     Cracks/damage/wear → Replace the defective gear(s).
4. Check:
   - Transmission gear engagement
     (each pinion gear to its respective wheel gear)
     Incorrect → Reassemble the transmission axle assemblies.

NOTE:

When reassembling the main axle "1", press the 2nd pinion gear "2" onto it as shown.



a. 102.2–102.4 mm

5. Check:
   - Transmission gear movement
     Rough movement → Replace the defective part(s).
6. Check:
   - Circlips
     Bends/damage/looseness → Replace.

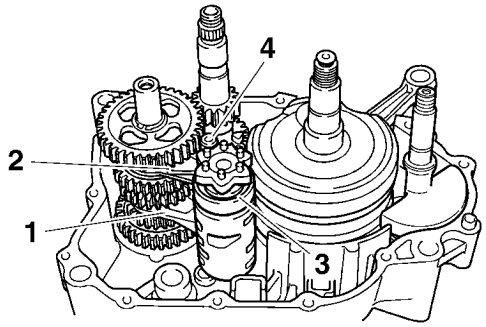
EAS26320

INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

1. Install:
   - Shift fork-L "1"
   - Shift fork-C
   - Shift fork-R "2"
   - Shift drum assembly "3"
   - Shift fork guide bars "4"

NOTE:

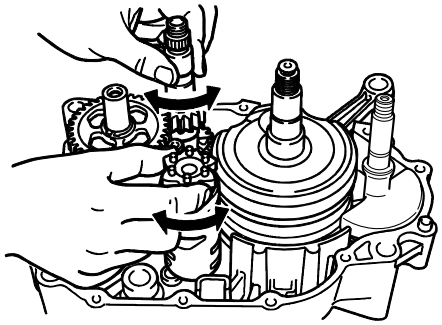
The embossed marks ("R"/"C"/"L") on the shift forks should face towards the right side of the engine.



2. Check:
   - Transmission
     Rough movement → Repair.

NOTE:

Oil each gear, shaft, and bearing thoroughly.

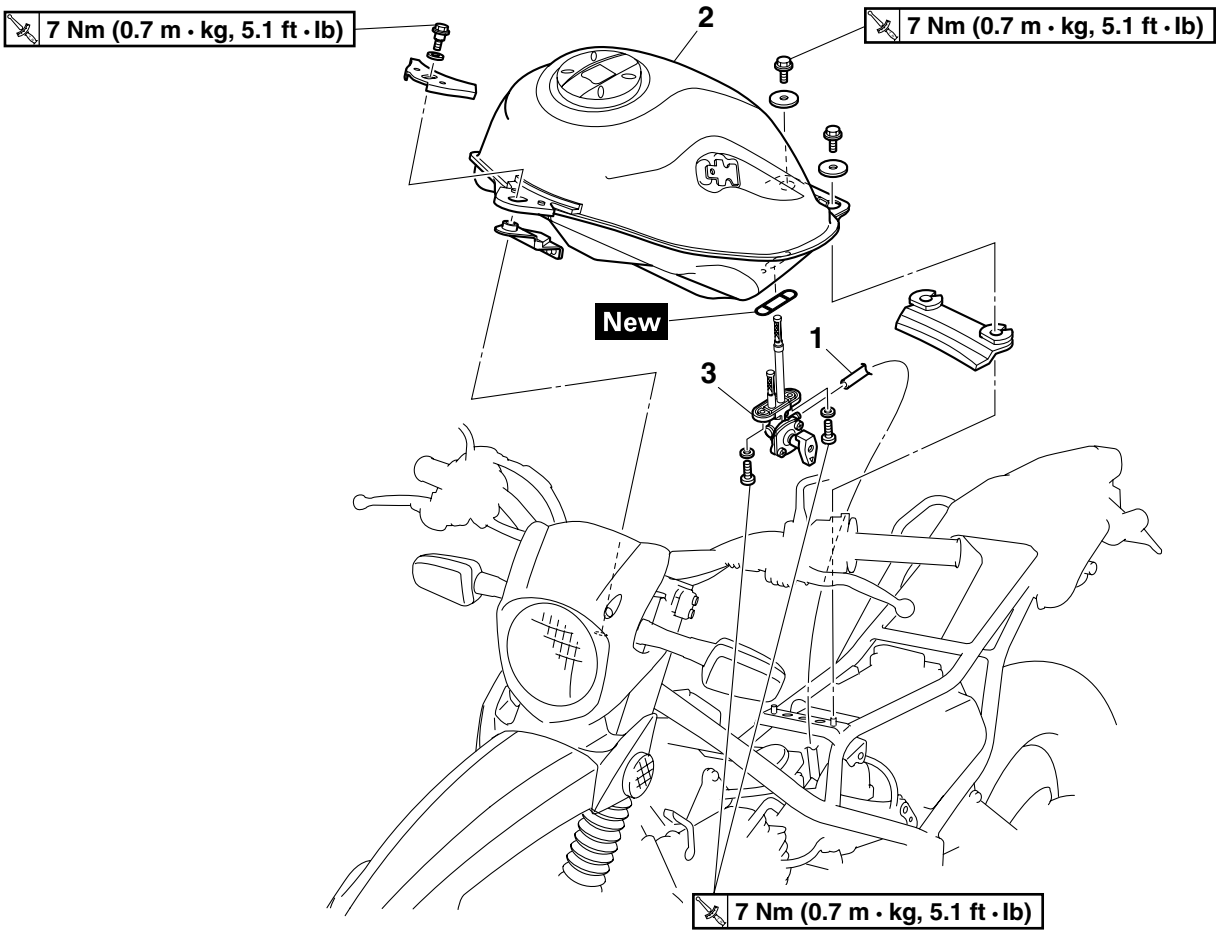


FUEL SYSTEM

EAS26620

FUEL TANK

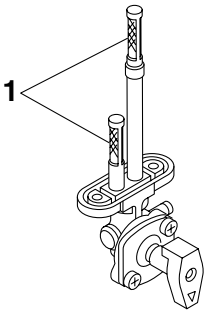
Removing the fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
	Left fuel tank side cover/right fuel tank side cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel hose	1	Disconnect.
2	Fuel tank	1	
3	Fuel cock	1	
			For installation, reverse the removal procedure.

EAS26650
CHECKING THE FUEL COCK

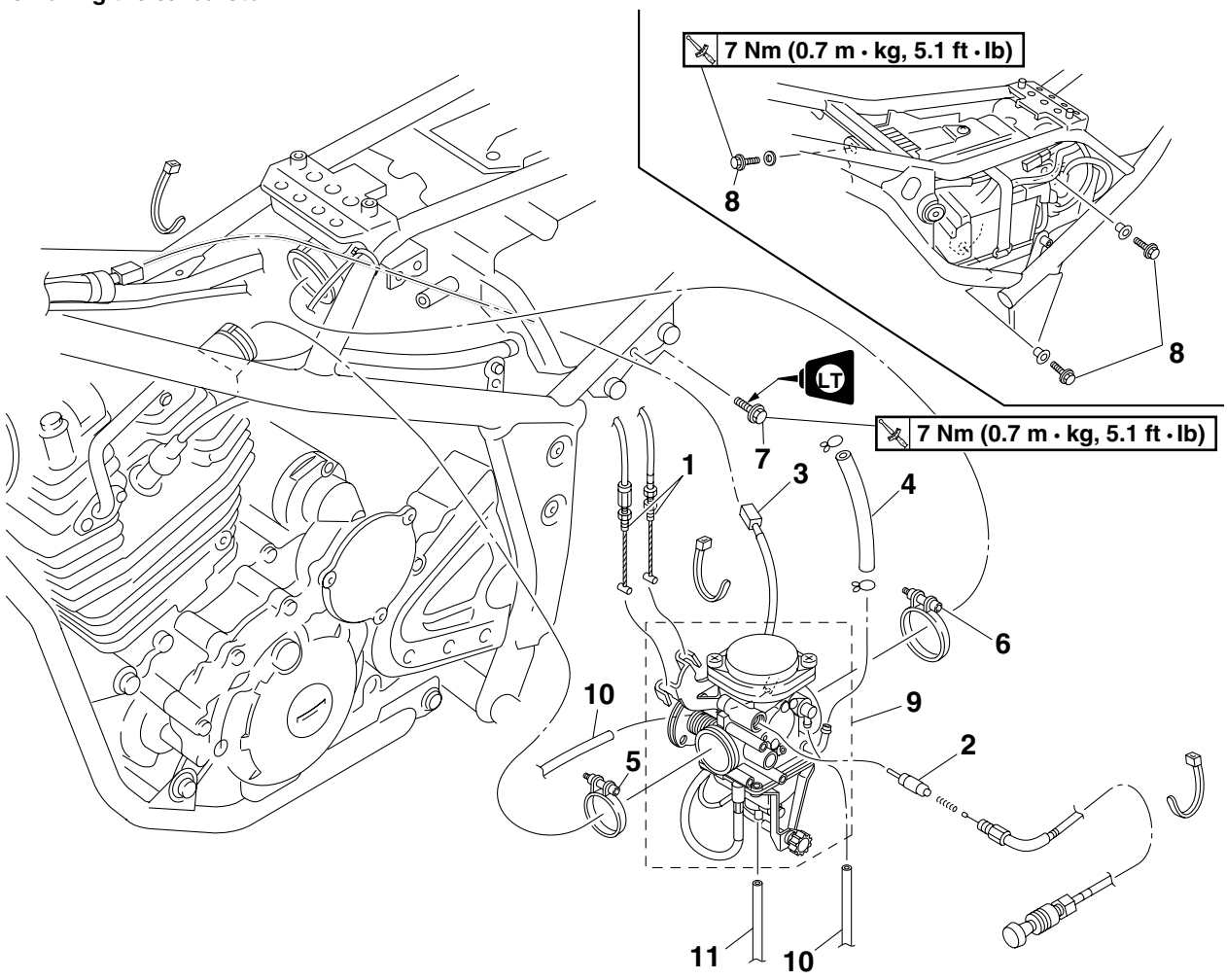
1. Check:
   - Fuel cock
     Cracks/damage/wear → Replace.
2. Check:
   - Fuel cock strainer “1”
     Obstruction → clean.
     Blow out the jets with compressed air.
     Damage → Replace.



EAS26720

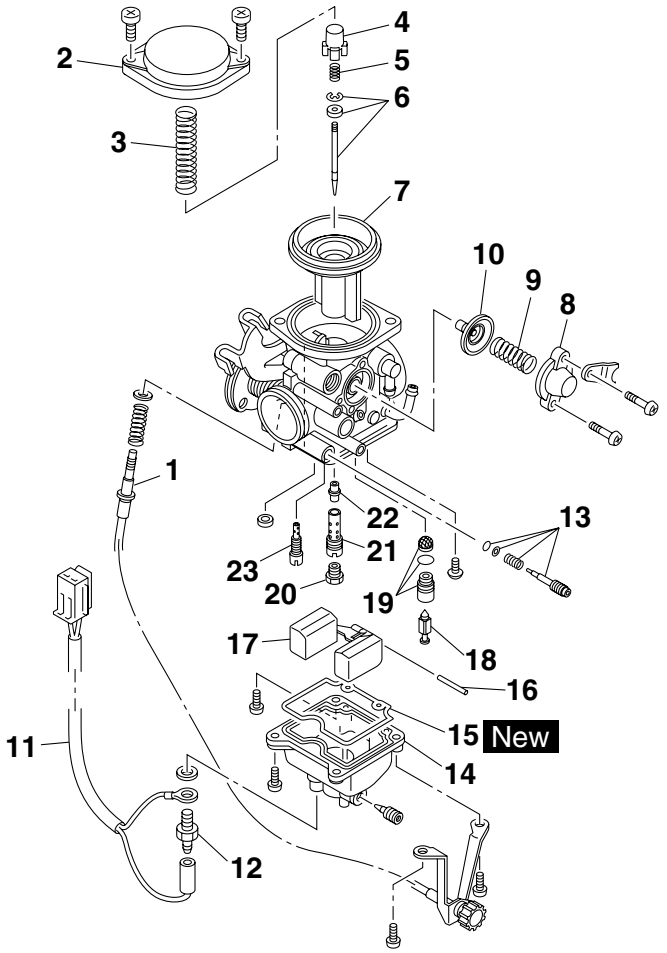
CARBURETOR

Removing the carburetor



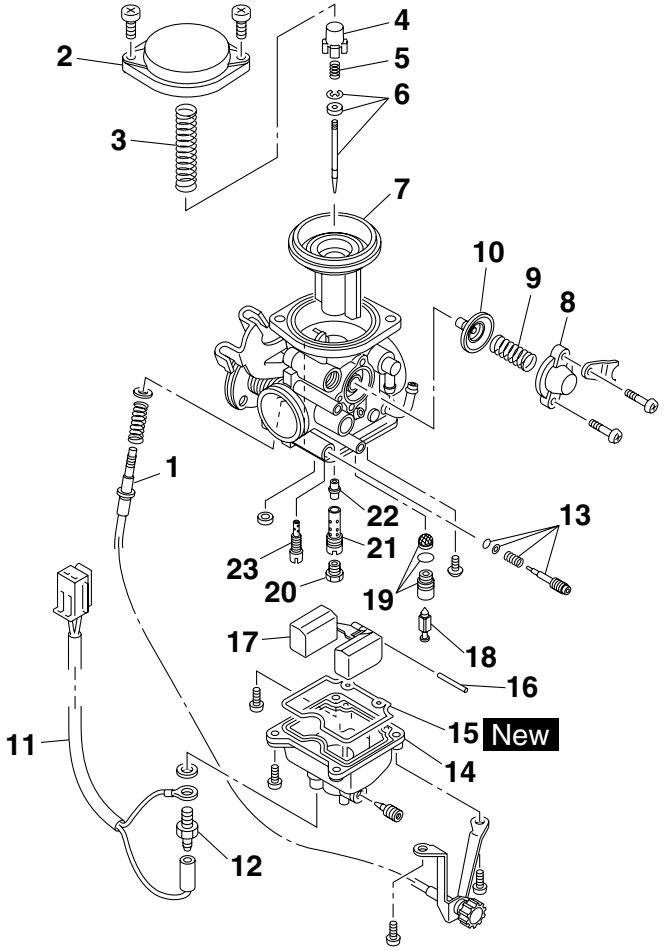
Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 6-9.
1	Throttle cable	2	
2	Starter plunger	1	
3	Carburetor warmer coupler	1	Disconnect.
4	Fuel hose	1	
5	Intake manifold clamp screw	1	Loosen.
6	Carburetor joint clamp screw	1	Loosen.
7	Air filter case bolt	1	
8	Battery/electrical compornents box bolt	3	**NOTE:** Remove the air filter case bolts and the battery/electric parts box bolts, and then slide both the air filter case and the battery/electric parts box backward.
9	Carburetor assembly	1	
10	Carburetor air vent hose	2	
11	Carburetor fuel drain hose	1	
			For installation, reverse the removal procedure.

Disassembling the carburetor



Order	Job/Parts to remove	Q'ty	Remarks
1	Throttle stop screw	1	
2	Vacuum chamber cover	1	
3	Piston valve spring	1	
4	Jet needle holder	1	
5	Spring	1	
6	Jet needle kit	1	
7	Piston valve	1	
8	Coasting enricher cover	1	
9	Coasting enricher spring	1	
10	Coasting enricher diaphragm	1	
11	Carburetor warmer lead	1	
12	Carburetor warmer	1	
13	Pilot screw set	1	
14	Float chamber	1	
15	Float chamber rubber gasket	1	
16	Float pin	1	
17	Float	1	
18	Needle valve	1	
19	Needle valve seat	1	
20	Main jet	1	

Disassembling the carburetor



Order	Job/Parts to remove	Q'ty	Remarks
21	Main jet holder	1	
22	Needle jet	1	
23	Pilot jet	1	
			For assembly, reverse the disassembly procedure.

EAS26760
CHECKING THE CARBURETOR

1. Check:
   - Carburetor body
   - Float chamber
   - Jet housing
   Cracks/damage → Replace.
2. Check:
   - Fuel passages
   Obstruction → Clean.

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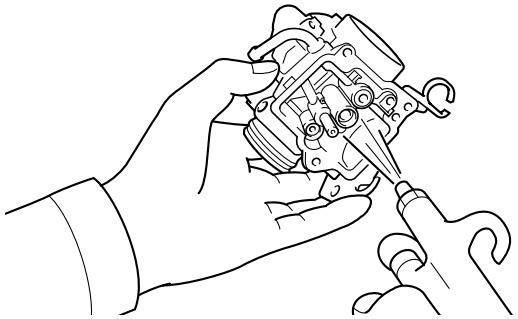
a. Wash and clean the carburetor with a kerosene. Never use a poor volatile carburetor cleaner.
b. Clean all carburetor passages by air blow.



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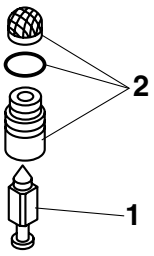
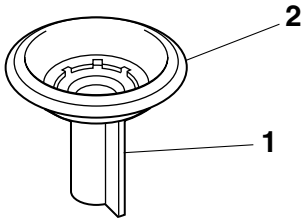
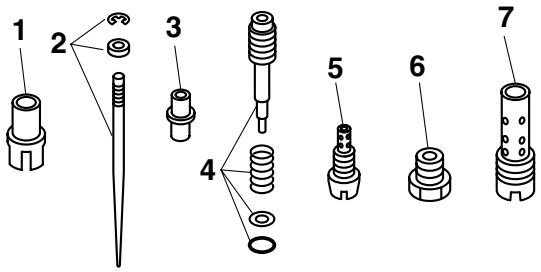
3. Check:
   - Float chamber body
   Dirt → Clean.
4. Check:
   - Float
   Damage → Replace.
5. Check:
   - Needle valve “1”
   - Needle valve seat “2”
   Damage/obstruction/wear → Replace the needle valve and needle valve seat.



6. Check:
   - Piston valve “1”
   Damage/scratches/wear → Replace.
   - Piston valve diaphragm “2”
   Cracks/tears → Replace.



7. Check:
   - Vacuum chamber cover
   - Piston valve spring
   Cracks/damage → Replace.
8. Check:
   - Coasting enricher cover
   - Coasting enricher spring
   - Coasting enricher diaphragm
   Cracks/damage → Replace.
9. Check:
   - Jet needle holder “1”
   Cracks/damage → Replace.
   - Jet needle kit “2”
   - Needle jet “3”
   - Pilot screw set “4”
   - Pilot jet “5”
   - Main jet “6”
   - Main jet holder “7”
   Bends/damage/wear → Replace.
   Obstruction → Blow out with compressed air.



10. Check:
    - Piston valve movement
    Insert the piston valve into the carburetor body and move it up and down.
    Tightness → Replace the piston valve.
11. Check:
    - Starter plunger
    - Starter plunger spring
    Bends/cracks/damage → Replace.
12. Check:
    - Hose joints

Cracks/damage → Replace.

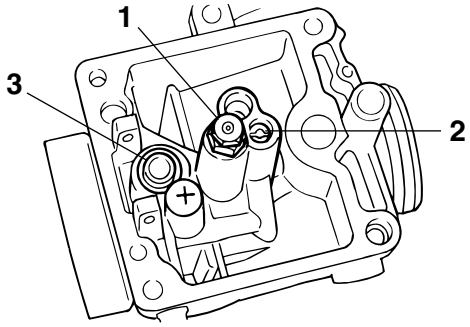
13. Check:
- Carburetor air vent hose
- Carburetor fuel drain hose
- Fuel hoses
  Cracks/damage/wear → Replace.
  Obstruction → Clean.
  Blow out the hoses with compressed air.

EAS26800
ASSEMBLING THE CARBURETOR

ECA14110
CAUTION:

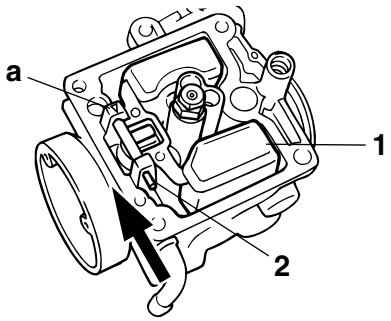
- **Before assembling the carburetor, wash all of the parts in a petroleum-based solvent.**
- **Always use a new gasket.**

1. Install:
- Needle jet
- Main jet holder
- Main jet "1"
- Pilot jet "2"
- Needle valve seat "3"



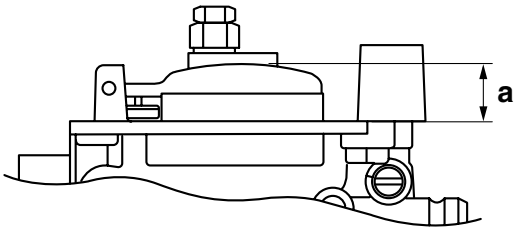
2. Install:
- Needle valve
- Float "1"
- Float pin "2"

NOTE:
Install the float pin in the reverse direction of arrow "a".



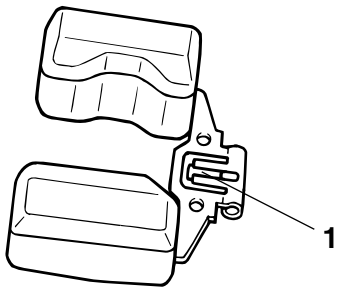
3. Check:
- Float height (dimention H) "a"
  Remove the float chamber rubber gasket, and measure the height from the float chamber matching face to the float top face.

Float height
11.9 mm (0.47 in)



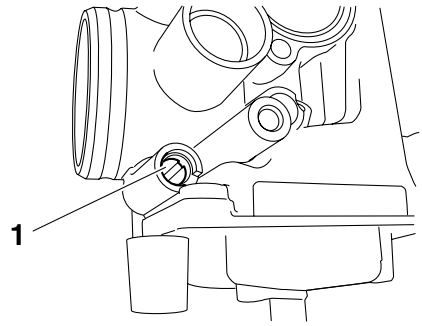
NOTE:
Temporarily lift the float, and check the oil level when the needle valve end slightly touches the float tongue.

Out of specification → Bend the loat tongue "1" and adjust.



4. Install:
- Float chamber
- Pilot screw "1"

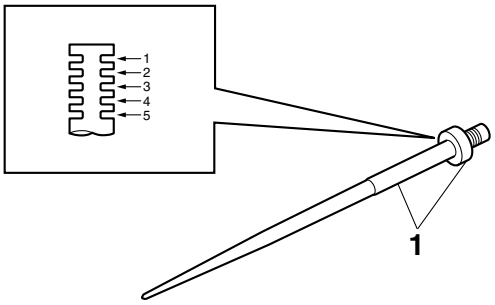
Pilot screw turn out
2–1/2



5. Install:
- Piston valve
- Jet needle holder
- Jet needle kit "1"

Clip position

	Standard clip position **3 levels**



EAS26890

INSTALLING THE CARBURETOR

1. Adjust:
   - Engine idling speed
     Refer to “ADJUSTING THE ENGINE IDLING SPEED” on page 3-8.

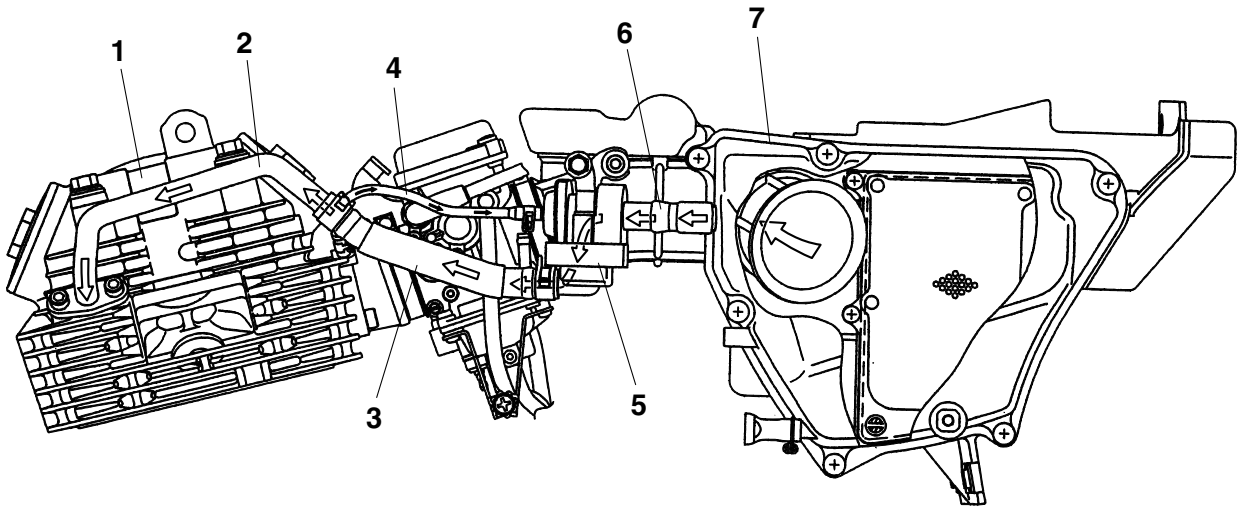
	Engine idling speed **1300–1500 r/min**

2. Adjust:
   - Throttle cable free play
     Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-9.

	Throttle cable free play **3.0–5.0 mm (0.12–0.20 in)**

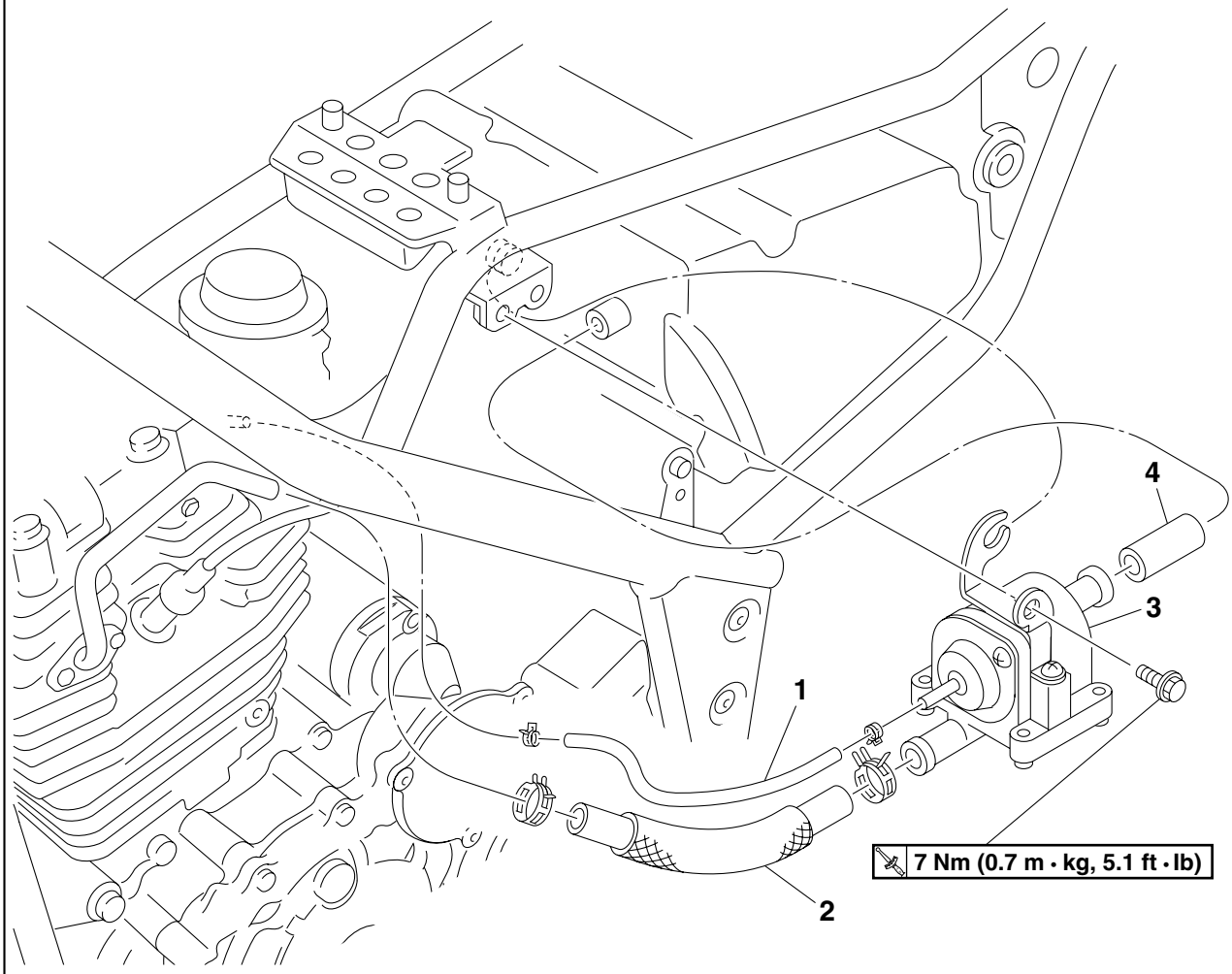
EAS27040

AIR INDUCTION SYSTEM



1. Cylinder head
2. Air induction system pipe
3. Air induction system hose (from the air cut-off valve to the cylinder head)
4. Air induction system vacuum hose
5. Air cut-off valve
6. Air induction system hose (from the air filter to the air cut-off valve)
7. Air filter case

Removing the air cut-off valve and hose



Order	Job/Part	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
1	Air induction system vacuum hose	1	
2	Air induction system hose (from the air cut-off valve to the cylinder head)	1	
3	Air cut-off valve	1	
4	Air induction system hose (from the air filter to the air cut-off valve)	1	
			For installation, reverse the removal procedure.

EAS27060

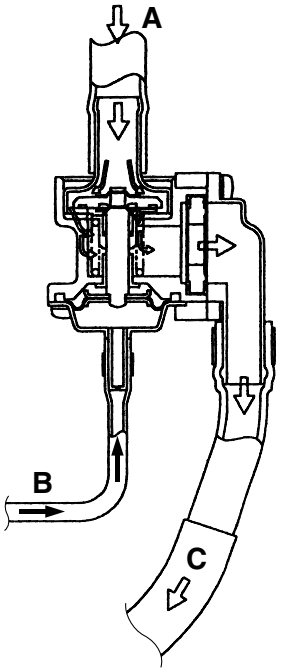
CHECKING THE AIR INDUCTION SYSTEM

Air induction

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of carbon monoxide. When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700°C.

Air cut-off valve

The air cut-off valve is controlled by the intake gas pressure from the intake manifold. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the vehicle is being driven. If the pressure drops when the engine speed is high, the air-cutoff valve is closed automatically.



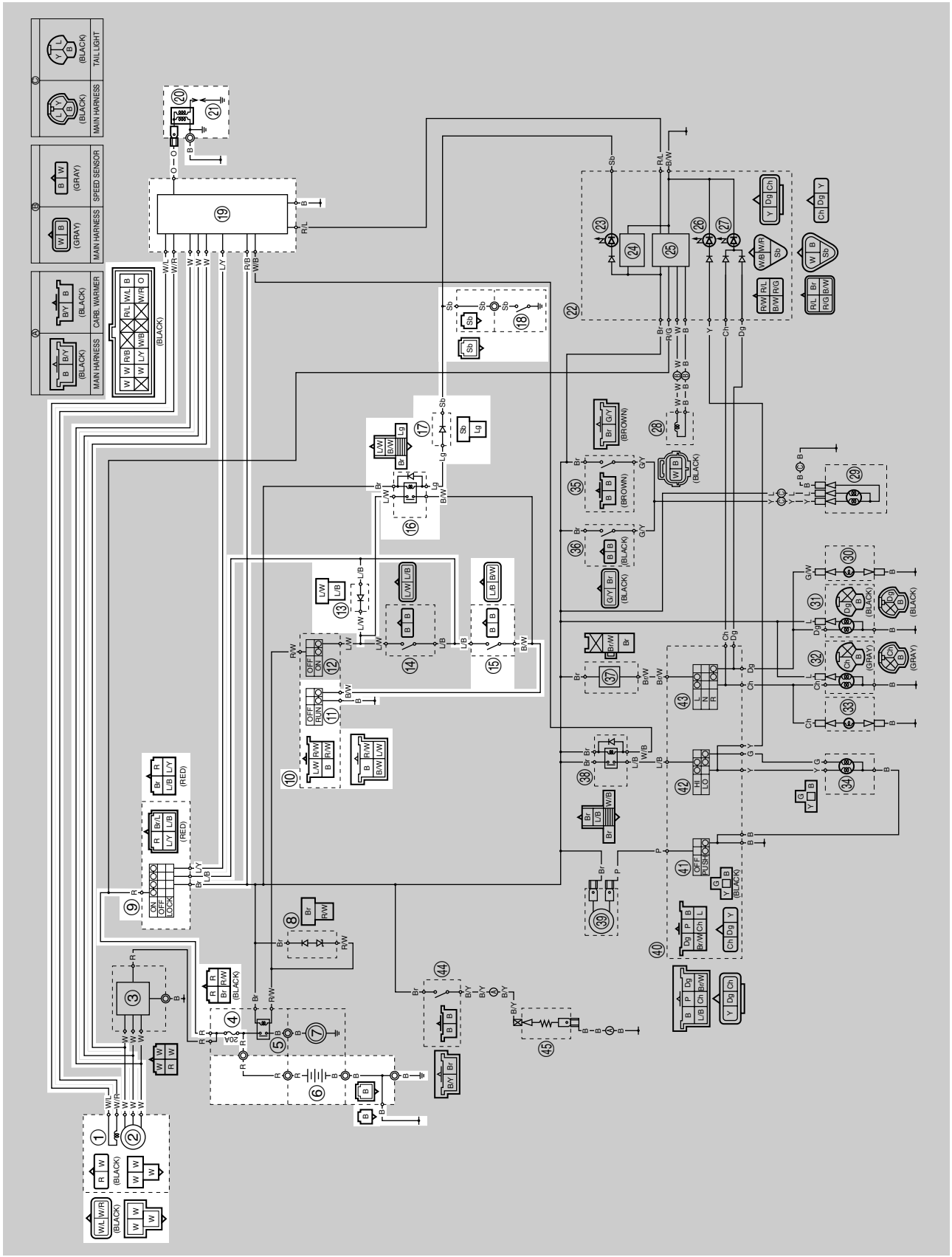
A. From the air filter
B. From the intake manifold
C. To the cylinder head

1. Check:
   - Hoses
     Loose connections → Connect properly.
     Cracks/damage → Replace.
   - Pipes
     Cracks/damage → Replace.
     Refer to “CYLINDER HEAD” on page 5-6.
2. Check:
   - Air cut-off valve
     Cracks/damage → Replace the reed valve.

ELECTRICAL SYSTEM

EAS27090
IGNITION SYSTEM

EAS27100
CIRCUIT DIAGRAM



1. Pickup coil
2. A.C. magneto
4. Fuse
6. Battery
9. Main switch
10. Right handlebar switch
11. Engine stop switch
13. Diode
15. Sidestand switch
16. Starting circuit cut-off relay
17. Diode 3
18. Neutral switch
19. C.D.I. unit
20. Ignition coil
21. Spark plug

EAS27130

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

NOTE:

Before troubleshooting, remove the following part(s):

1. Seat
2. Rear side cover
3. Tool box
4. Fuel tank
5. Carburetor assembly
6. Starter (choke) knob

1. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-37.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
3. Check the spark plug. Refer to "CHECKING THE SPARK PLUG" on page 3-8.	NG→	Re-gap or replace the spark plug.
OK↓		
4. Check the spark plug cap. Refer to "CHECKING THE SPARK PLUG CAP" on page 7-42.	NG→	Replace the spark plug cap.
OK↓		
5. Check the ignition coil. Refer to "CHECKING THE IGNITION COIL" on page 7-43.	NG→	Replace the ignition coil.
OK↓		
6. Check the pickup coil. Refer to "CHECKING THE PICKUP COIL" on page 7-44.	NG→	Replace the pickup coil/stator assembly.
OK↓		
7. Check the stator coil. Refer to .	NG→	Replace the pickup coil/stator assembly.
OK↓		
8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the main switch.
OK↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Poor conducting of engine stop switch. Replace the right handlebar switch.
OK↓		

10.Check the sidestand switch.
Refer to "CHECKING THE SWITCHES" on page 7-33.
NG→ Replace the sidestand switch.
OK↓

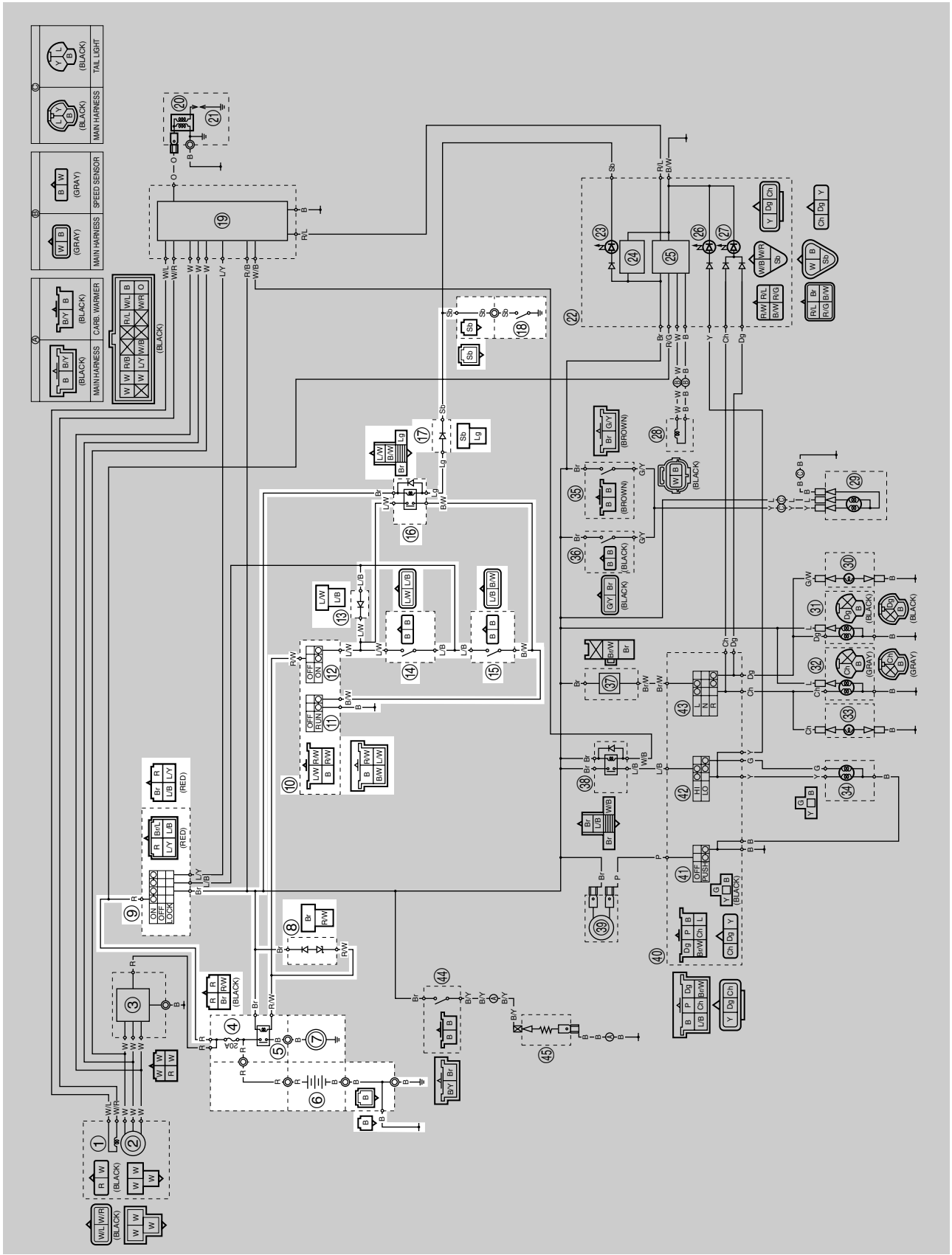
11.Check the clutch switch.
Refer to "CHECKING THE SWITCHES" on page 7-33.
NG→ Replace the clutch switch.
OK↓

12.Checking the entire ignition system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 7-1.
NG→ Properly connect or repair the ignition system's wiring.
OK↓

Replace the C.D.I. unit.

EAS27160
ELECTRIC STARTING SYSTEM

EAS27170
CIRCUIT DIAGRAM



4. Fuse
5. Starter relay
6. Battery
7. Starter motor
8. Diode 1
9. Main switch
10. Right handlebar switch
11. Engine stop switch
12. Start switch
13. Diode 2
14. Clutch switch
15. Sidestand switch
16. Starting circuit cut-off relay
17. Diode 3
18. Neutral switch

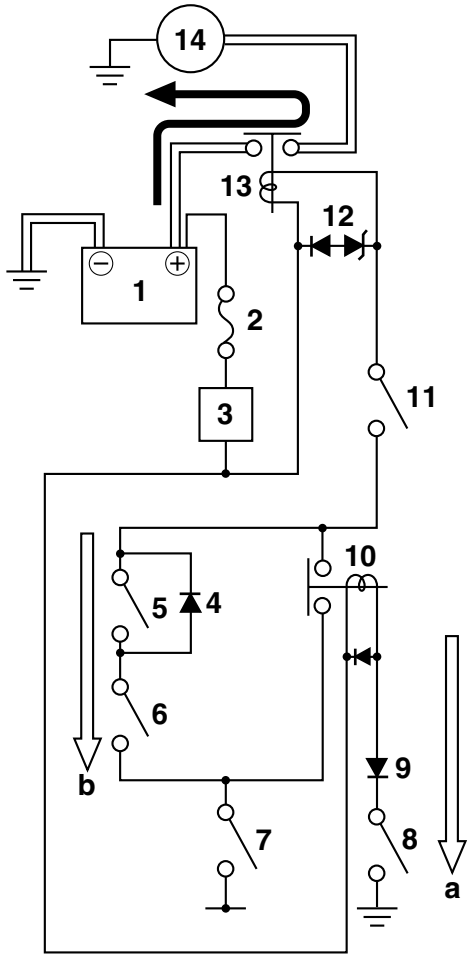
EAS27180

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to "○" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. If any of the above has occurred and if the starting circuit cut-off relay is turned ON, you can start the engine by pressing starter switch "○".



a. WHEN THE TRANSMISSION IS IN NEUTRAL
b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

1. Battery
2. Fuse
3. Main switch
4. Diode2
5. Clutch switch
6. Sidestand switch
7. Engine stop switch
8. Neutral switch
9. Diode3
10. Starting circuit cut-off relay
11. Start switch
12. Diode1
13. Starter relay
14. Starter motor

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

NOTE:

Before troubleshooting, remove the following part(s):

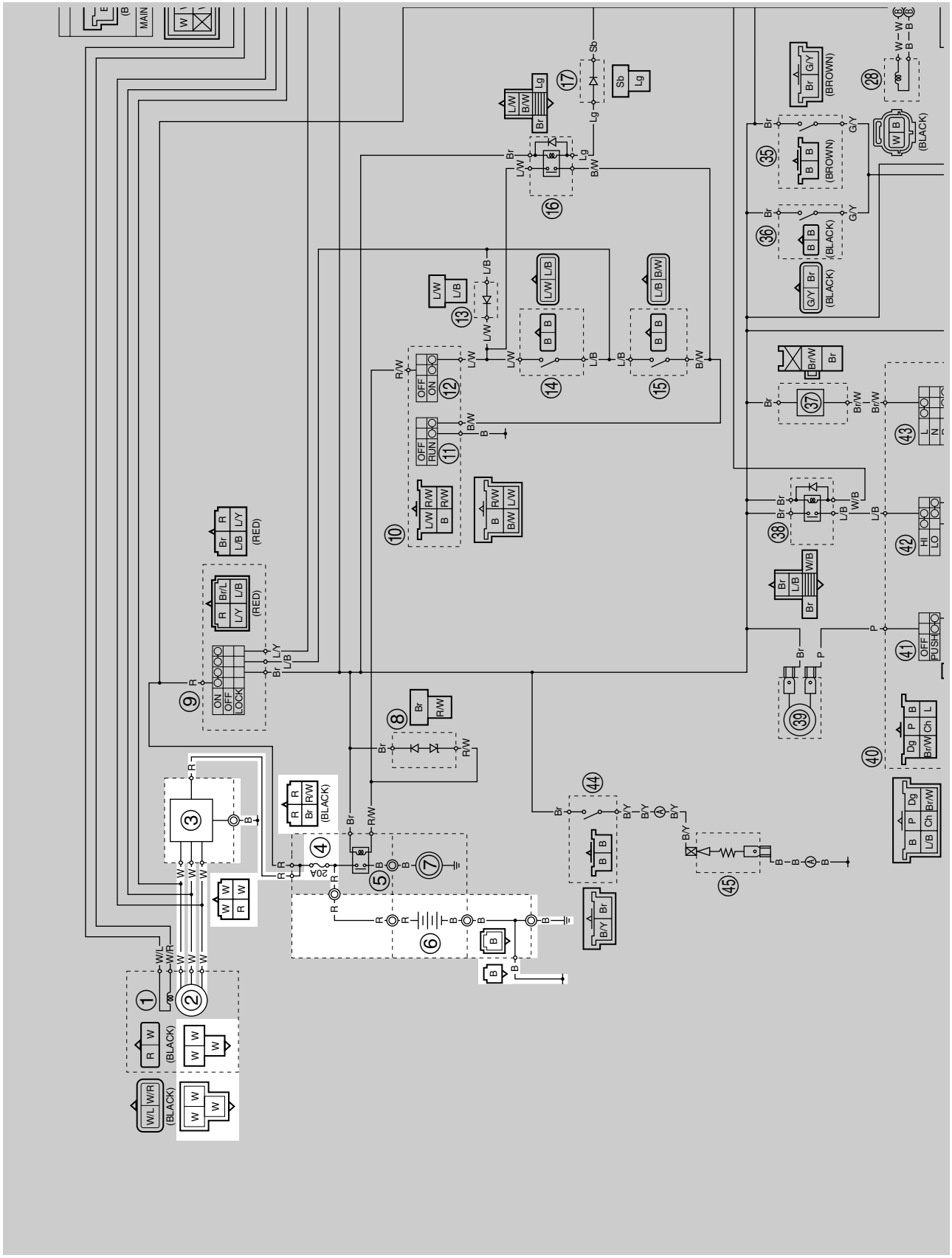
1. Seat
2. Rear side cover
3. Tool box
4. Fuel tank
5. Carburetor assembly

1. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-37.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
3. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-52.	NG→	Repair or replace the starter motor.
OK↓		
4. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 7-40.	NG→	Replace the starting circuit cut-off relay.
OK↓		
5. Check the diode2. Refer to "CHECKING THE DIODE" on page 7-42.	NG→	Replace the diode2.
OK↓		
6. Check the diode3. Refer to "CHECKING THE DIODE" on page 7-42.	NG→	Replace the diode3.
OK↓		
7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 7-40.	NG→	Replace the starter relay.
OK↓		
8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the main switch.
OK↓		
9. Checking the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Poor conducting of engine stop switch. Replace the right handlebar switch.
OK↓		

10.Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the right handlebar switch.
OK↓		
11.Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the neutral switch.
OK↓		
12.Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the sidestand switch.
OK↓		
13.Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the clutch switch.
OK↓		
14.Check the start switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Poor conducting of engine stop switch. Replace the right handlebar switch.
OK↓		
15.Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-5.	NG→	Properly connect or repair the starting system's wiring
OK↓		
The starting system circuit is OK.		

EAS27200
CHARGING SYSTEM

EAS27210
CIRCUIT DIAGRAM



2. A.C. magneto
3. Rectifier/regulator
4. Fuse
6. Battery

EAS27220

TROUBLESHOOTING

The battery is not being charged.

NOTE:

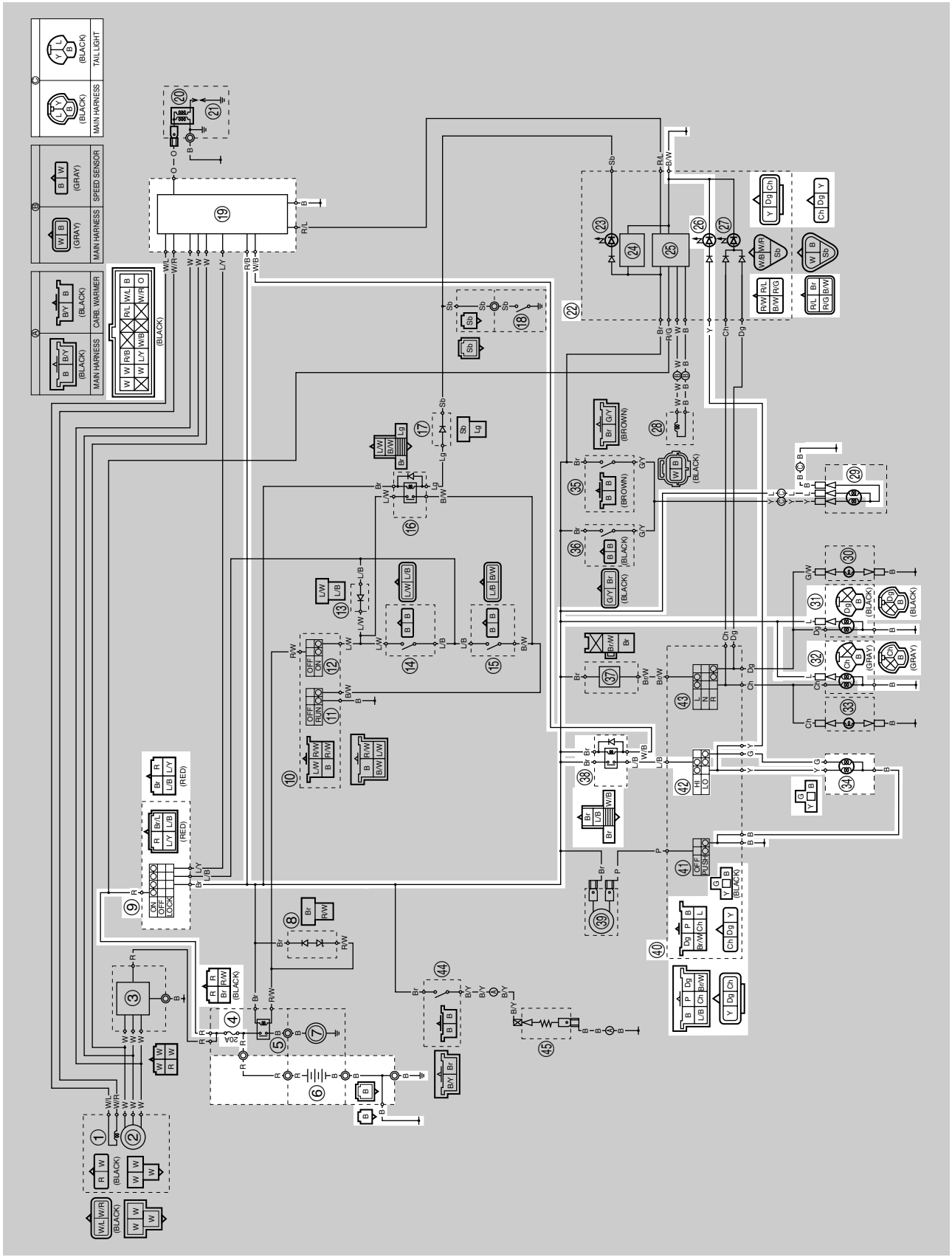
Before troubleshooting, remove the following part(s):

1. Seat
2. Rear side cover
3. Fuel tank
4. Carburetor assembly

1. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-37.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 7-44.	NG→	Replace the stator assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 7-45.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-11.	NG→	Properly connect or repair the charging system's wiring.
OK↓		
This circuit is OK.		

EAS27240
LIGHTING SYSTEM

EAS27250
CIRCUIT DIAGRAM



4. Fuse
6. Battery
9. Main switch
19. C. D. I. unit
22. Meter assembly
26. High beam indicator light
29. Tail/brake light
31. Front turn signal light (right)
32. Front turn signal light (left)
34. Headlight
38. Headlight relay
40. Left handlebar switch
42. Dimmer switch

EAS27260

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, license light or meter light.

NOTE:

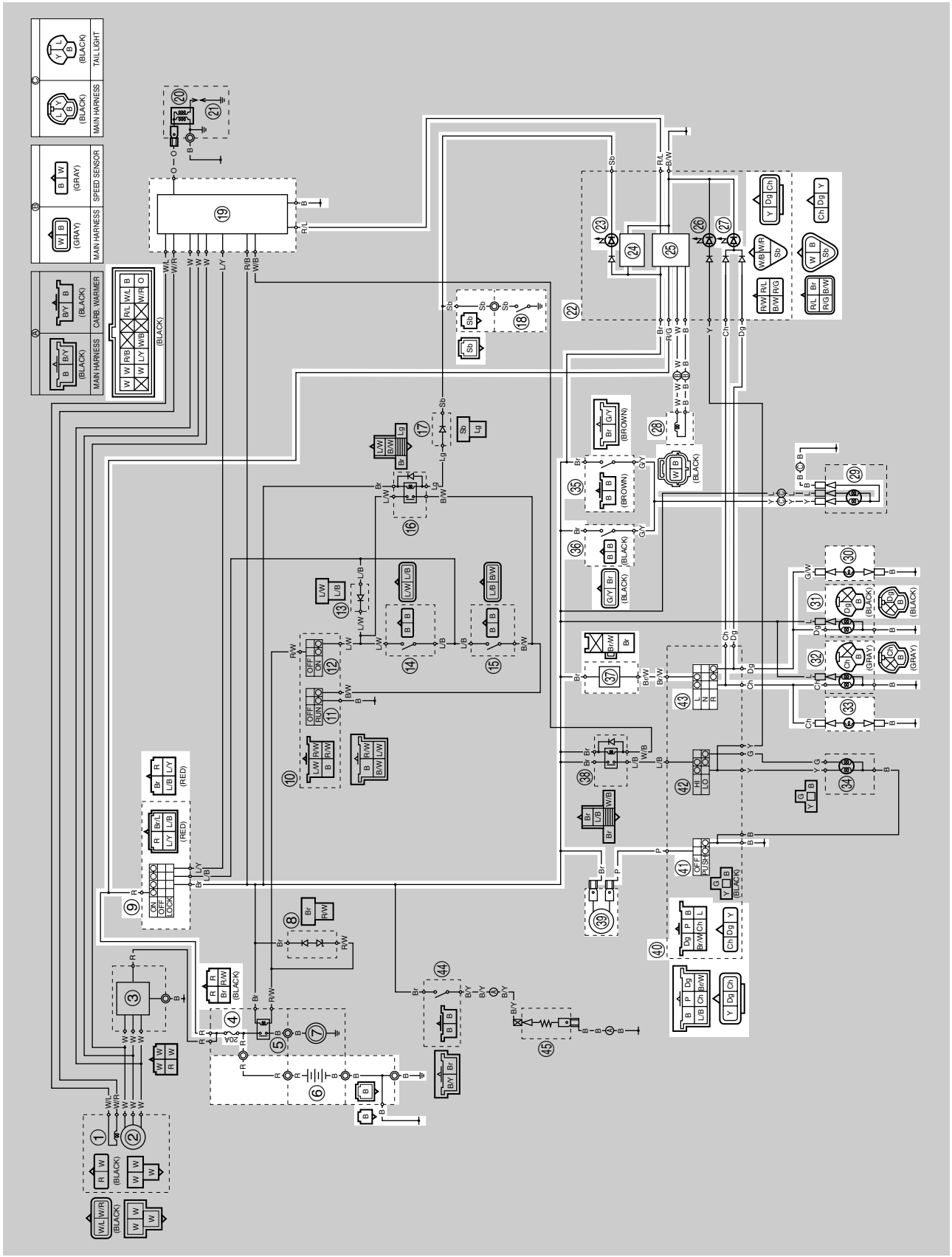
Before troubleshooting, remove the following part(s):

1. Seat
2. Rear side cover
3. Tool box

1. Check the each bulbs and bulb sockets condition. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-36.	NG→	Replace the bulb(s), bulb socket(s) or both.
OK↓		
2. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse(s).
OK↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-37.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the main switch.
OK↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	The dimmer switch is faulty. Replace the left handlebar switch.
OK↓		
6. Check the headlight relay (on/off). Refer to "CHECKING THE RELAYS" on page 7-40.	NG→	Replace the headlight relay.
OK↓		
7. Check the headlight relay (dimmer). Refer to "CHECKING THE RELAYS" on page 7-40.	NG→	Replace the headlight relay.
OK↓		
8. Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.	NG→	Properly connect or repair the lighting system's wiring.
OK↓		
This circuit is OK.		

EAS27270
SIGNALING SYSTEM

EAS27280
CIRCUIT DIAGRAM



4. Fuse
6. Battery
9. Main switch
18. Neutral switch
19. C. D. I. unit
22. Meter assembly
23. Neutral indicator light
24. Multi-function display
25. Speedometer
27. Turn signal indicator light
28. Speed sensor
29. Tail/brake light
30. Rear turn signal light (right)
31. Front turn signal light (right)
32. Front turn signal light (left)
33. Rear turn signal light (left)
35. Rear brake light switch
36. Front brake light switch
37. Turn signal relay
39. Horn
40. Left handlebar switch
41. Horn switch
43. Turn signal switch

EAS27290

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.
- The speedometer fails to operate.

NOTE:

Before troubleshooting, remove the following part(s):

1. Seat
2. Rear side cover
3. Tool box

1. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-37.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the main switch.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-19.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		

Check the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Poor conducting of horn switch. Replace the left handlebar switch.
OK↓		
2. Check the horn. Refer to "CHECKING THE HORN" on page 7-45.	NG→	Replace the horn.
OK↓		
3. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-19.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		

The tail/brake light fails to come on.

1. Check the tail/brake light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-36.	NG→	Replace the tail/brake light bulb, socket or both.
OK↓		
2. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the front brake light switch.
OK↓		
3. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the rear brake light switch.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-19.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-36.	NG→	Replace the turn signal light bulb, socket or both.
OK↓		
2. Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Poor conducting of turn signal switch. Replace the left handlebar switch.
OK↓		
3. Check the turn signal relay. Refer to "CHECKING THE RELAYS" on page 7-40.	NG→	Replace the turn signal relay.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-19.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
Meter assembly		

The neutral indicator light fails to come.

1. Check the neutral switch.
   Refer to "CHECKING THE SWITCHES" on page 7-33.

NG→ Replace the neutral switch.

OK↓

2. Check the entire signaling system's wiring.
   Refer to "CIRCUIT DIAGRAM" on page 7-19.

NG→ Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The speedometer fails to operate.

1. Check the speed sensor.
   Refer to "CHECKING THE SPEED SENSOR" on page 7-46.

NG→ Replace the speed sensor.

OK↓

2. Check the entire signaling system's wiring.
   Refer to "CIRCUIT DIAGRAM" on page 7-19.

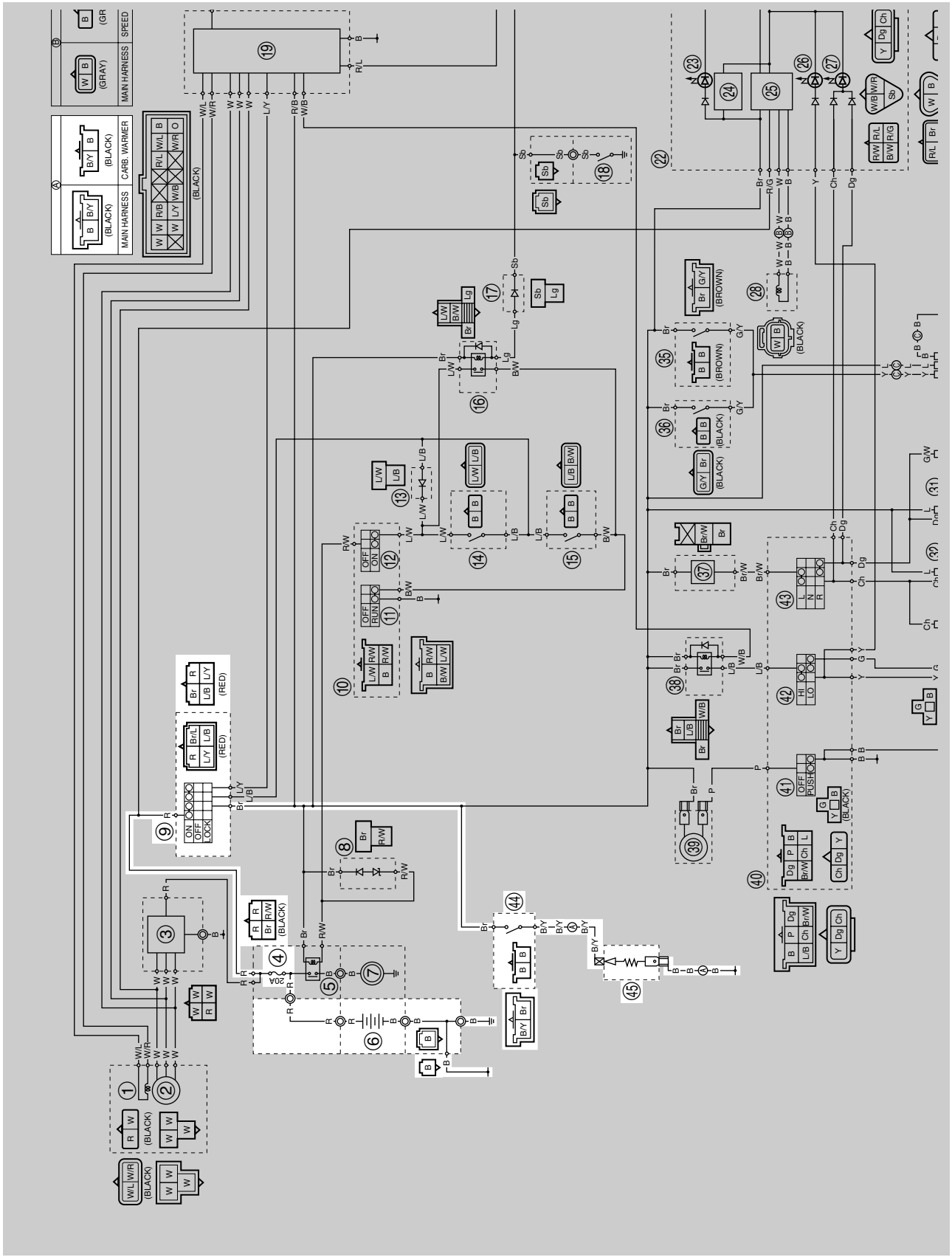
NG→ Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

EAS27490
CARBURETOR HEATING SYSTEM

EAS27500
CIRCUIT DIAGRAM



4. Fuse
6. Battery
9. Main switch
44. Thermo switch
45. Carburetor warmer

EAS27510

TROUBLESHOOTING

The carburetor warmer system fails to operate.

NOTE:

Before troubleshooting, remove the following part(s):

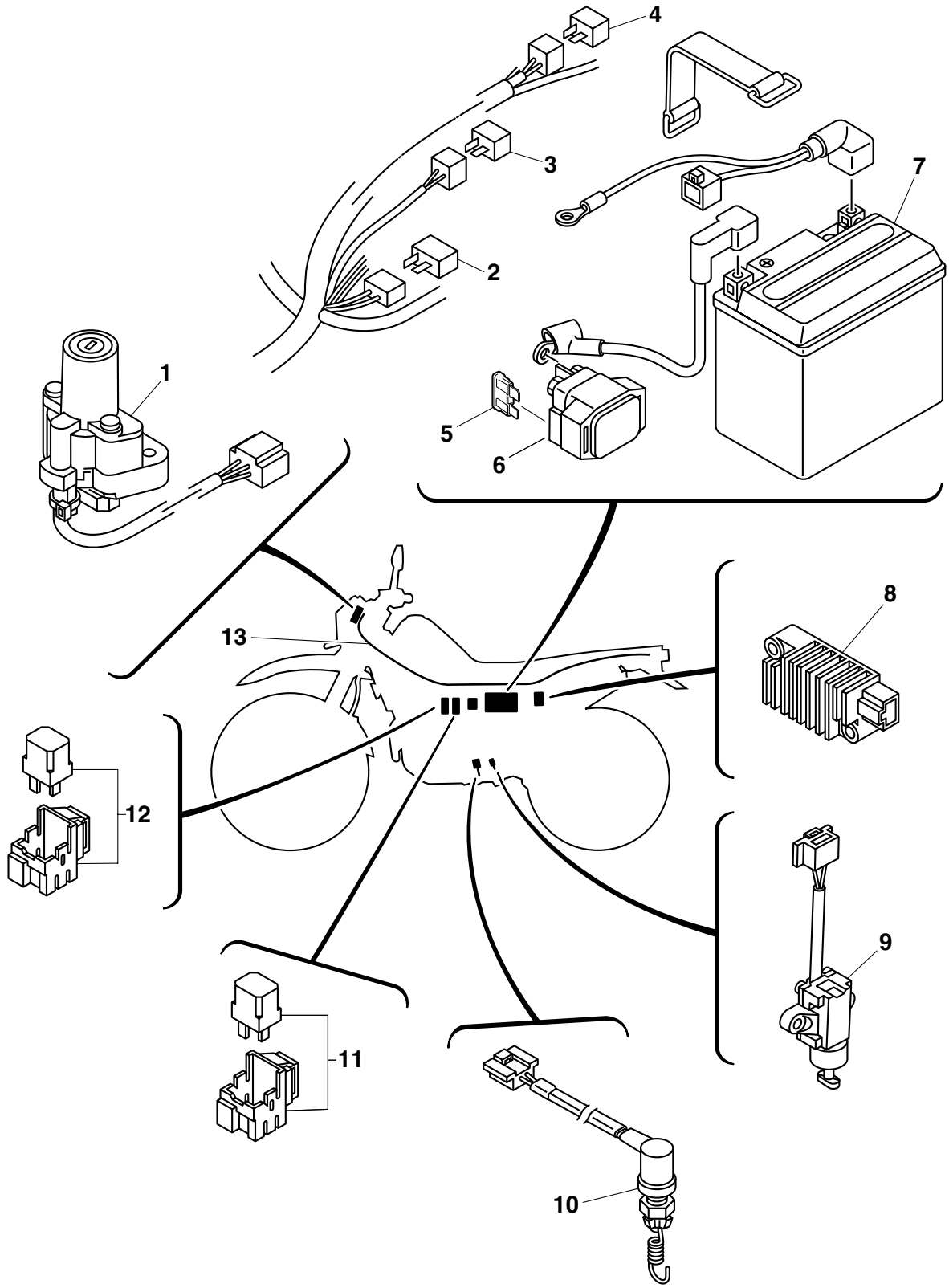
1. Seat
2. Rear side cover
3. Tool box
4. Fuel tank
5. Carburetor assembly
6. Rectifier/regulator

1. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-37.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-33.	NG→	Replace the main switch.
OK↓		
4. Check the thermo switch. Refer to "CHECKING THE THERMO SWITCH" on page 7-46.	NG→	Replace the thermo switch.
OK↓		
5. Check the carburetor warmer. Refer to "CHECKING THE CARBURETOR WARMER" on page 7-47.	NG→	Replace the carburetor warmer.
OK↓		
6. Check the entire carburetor heating system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-25.	NG→	Properly connect or repair the carburetor heating system's wiring.
OK↓		
This circuit is OK.		

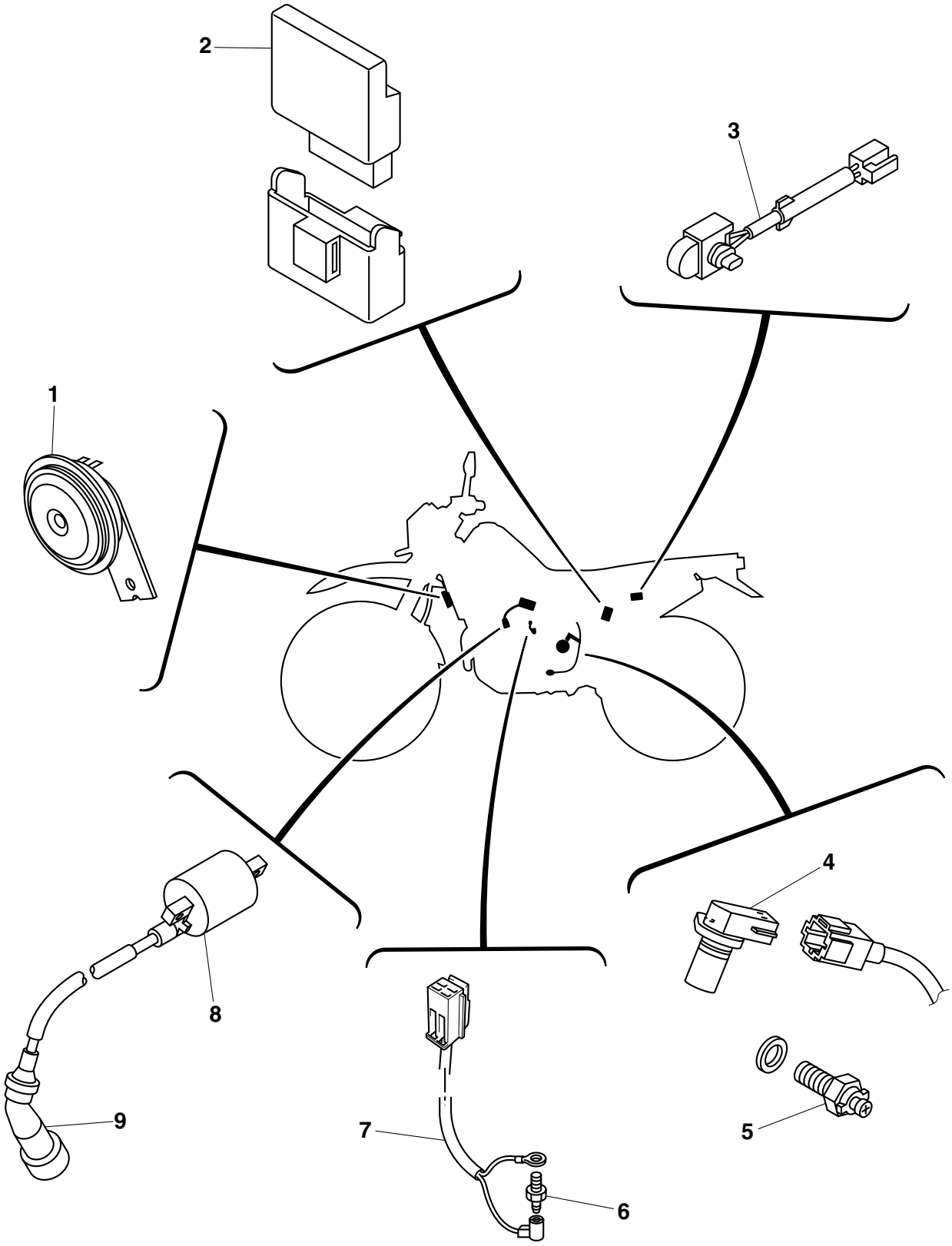
EAS27971

ELECTRICAL COMPONENTS

EAS3C51017



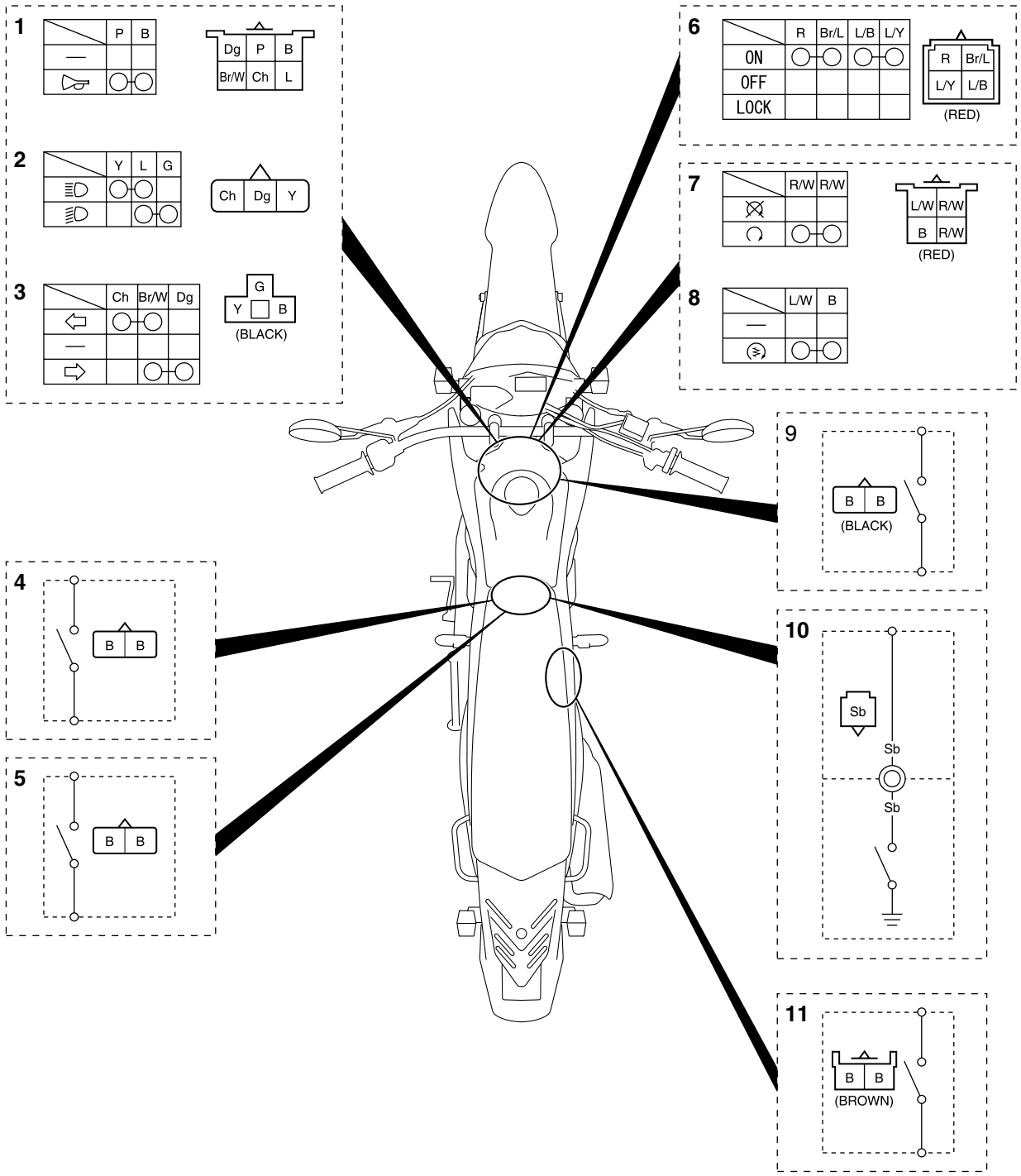
1. Main switch
2. Diode1
3. Diode3
4. Diode2
5. Fuse
6. Starter relay
7. Battery
8. Rectifier/regulator
9. Sidestand switch
10. Rear brake light switch
11. Headlight relay
12. Starting circuit cut-off relay
13. Wire harness


2
3
1
8
4
9
7
5
6

1. Horn
2. CDI unit
3. Thermo switch
4. Speed sensor
5. Neutral switch
6. Carburetor warmer
7. Carburetor warmer lead
8. Ignition coil
9. Spark plug cap

EAS27980

CHECKING THE SWITCHES



1. Horn switch
2. Dimmer switch
3. Turn signal switch
4. Clutch switch
5. Sidestand switch
6. Main switch
7. Engine stop switch
8. Start switch
9. Front brake light switch
10. Neutral switch
11. Rear brake light switch

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

ECA14370

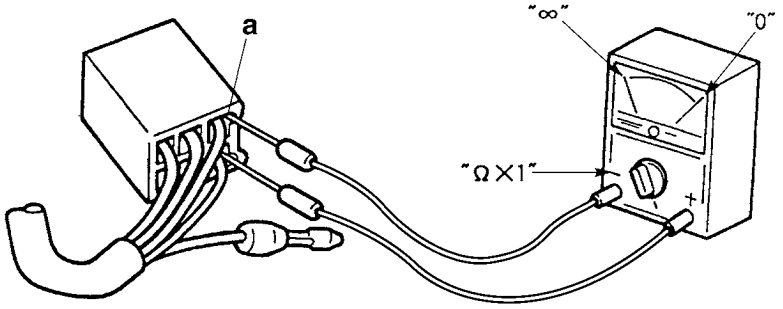
CAUTION:

Never insert the tester probes into the coupler terminal slots "a". Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

	**Pocket tester** **90890-03132**

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.



The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on below.

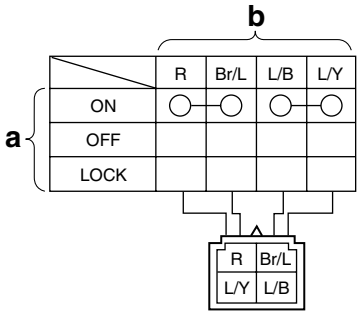
The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row in the switch illustration.

NOTE:

" ○——○ " indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration below shows that:

This chart shows that the switch circuit is conductive when the switch is "ON" for Red, Brown/Blue, Blue/Black, and Blue/Yellow.



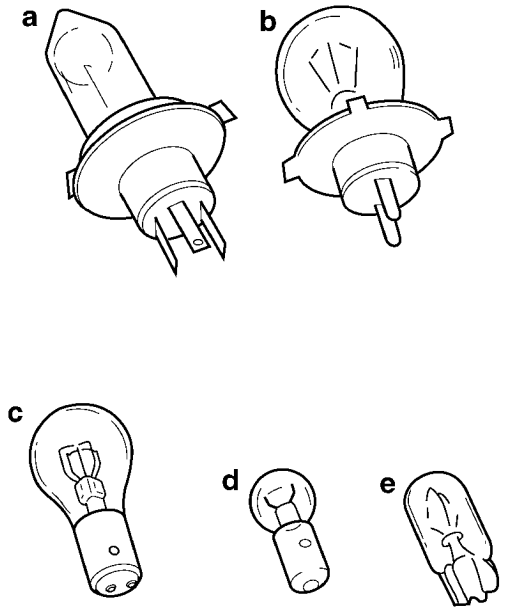
EAS27990
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.
Damage/wear → Repair or replace the bulb, bulb socket or both.
Improperly connected → Properly connect.
No continuity → Repair or replace the bulb, bulb socket or both.

Types of bulbs

The bulbs used on this vehicle are shown in the illustration on the left.

- Bulbs "a" and "b" are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulbs "c" is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs "d" and "e" are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.



Checking the condition of the bulbs

The following procedure applies to all of the bulbs.

1. Remove:
   - Bulb

EWA13320
WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

ECA14380
CAUTION:

- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly it with a cloth moistened with alcohol or lacquer thinner.**

2. Check:
   - Bulb (for continuity)
     (with the pocket tester)
     No continuity → Replace.

	Pocket tester **90890-03132**

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.

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a. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "2", and check the continuity.
b. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "3", and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

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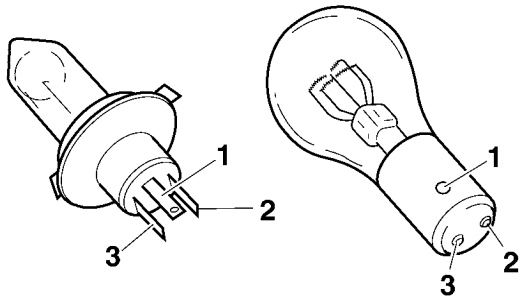
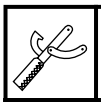


Checking the condition of the bulb sockets
The following procedure applies to all of the bulb sockets.
1. Check:
   • Bulb socket (for continuity)
   (with the pocket tester)
   No continuity → Replace.



Pocket tester
90890-03132

NOTE:
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

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a. Install a good bulb into the bulb socket.
b. Connect the pocket tester probes to the respective leads of the bulb socket.
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

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EAS28000
CHECKING THE FUSE
The following procedure applies to all of the fuse.
EC3C51005
CAUTION:
To avoid a shortcircuit, disconnect the negative battery lead from the battery terminal before you check or replace the fuse.

1. Remove:
   • Seat
   • Rear right side cover
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
   • Fuse

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a. Connect the pocket tester to the fuse and check the continuity.

NOTE:
Set the pocket tester selector to "Ω × 1".

Pocket tester
90890-03132

b. If the pocket tester indicates "∞", replace the fuse.

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3. Replace:
   • Blown fuse

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a. Set the main switch to "OFF".
b. Install a new fuse of the correct amperage rating.
c. Set on the switches to verify if the electrical circuit is operational.
d. If the fuse immediately blows again, check the electrical circuit.

Fuse	Amperage rating	Q'ty
Fuse	20 A	1
Reserve	20 A	1

EWA13310
WARNING
Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

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4. Install:
   • Rear right side cover
   • Seat
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS28030
CHECKING AND CHARGING THE BATTERY
EWA13290
WARNING
Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:
- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTE**

OUT OF REACH OF CHILDREN.
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**

FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL
- **Skin — Wash with water.**
- **Eyes — Flush with water for 15 minutes and get immediate medical attention.**

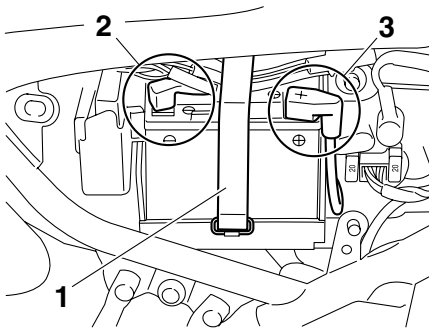
INTERNAL
- **Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.**

ECA13660
CAUTION:
- **This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.**
- **Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**

NOTE:
Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
   - Seat
   - Rear right side cover
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Disconnect:
   - Battery band "1"
   Battery leads
   (from the battery terminals)

EC3C51008
CAUTION:
Always disconnect negative battery lead "2" first, and then disconnect positive battery lead "3".



3. Remove:
   - Battery
4. Check:
   - Battery charge

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a. Connect a pocket tester to the battery terminals.

Positive tester probe →
Positive battery terminal
Negative tester probe →
Negative battery terminal

NOTE:
- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

b. Check the charge of the battery, as shown in the charts and the following example.

Example
Open-circuit voltage = 12.0 V
Charging time = 6.5 hours
Charge of the battery = 20–30%

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5. Charge:
   - Battery
   (refer to the appropriate charging method illustration)

EWA13300
⚠ WARNING
Do not quick charge a battery.

EC3C51007
CAUTION:
- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger. They force a high-amperage current into**

the battery quickly and can cause battery overheating and battery plate damage.

- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **Remove the battery when charging it. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative lead from the battery terminal.)**
- **To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.**
- **Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.**
- **Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.**
- **When the battery is charging, if abnormal heat is generated, disconnect the battery from the charger and allow the battery to cool down. Recharge the battery after its temperature has dropped. Hot batteries can explode!**
- **The open-circuit voltage of a MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.**

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Charging method using a variable-current (voltage) charger

a. Measure the open-circuit voltage before charging.

NOTE:

Voltage should be measured 30 minutes after the machine is stopped.

b. Connect a charged and AMP meter to the battery and start charging.

NOTE:

Set the charging voltage at 16–17 V.If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.

c. Make sure that the current is higher than the standard charging current written on the battery.

NOTE:

If the current is lower than the standard charging current written on the battery, set the charging voltage adjust dial at 20–24 V and monitor the amperage for 3–5 minutes to check the battery.

Reach the standard charging current
Battery is good.
Does not reach the standard charging current
Replace the battery.

d. Adjust the voltage so that the current is at the standard charging level.
e. Set the time according to the charging time suitable for the open-circuit voltage.
Refer to “Battery condition checking steps”.
f. If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.
g. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

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Charging method using a constant voltage charger

a. Measure the open-circuit voltage before charging.

NOTE:

Voltage should be measured 30 minutes after the machine is stopped.

b. Connect a charger and AMP meter to the battery and start charging.
c. Make sure that the current is higher than the standard charging current written on the battery.

NOTE:

If the current is lower than the standard charging current written on the battery, This type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.

d. Charge the battery until the battery’s charging voltage is 15 V.

NOTE:

Set the charging time at 20 hours (maximum).

e. Measure the battery open-circuit voltage af-

ter leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete. 12.7 V or less --- Recharging is required. Under 12.0 V --- Replace the battery.

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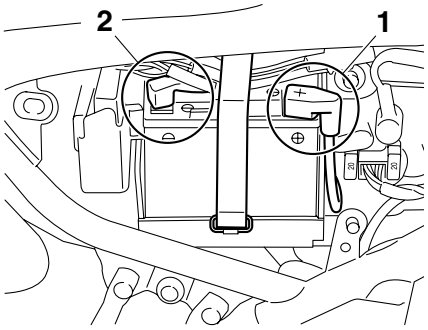
6. Install:
   • Battery
7. Connect:
   • Battery leads
   (to the battery terminals)

ECA13630

CAUTION:

First, connect the positive battery lead "1", and then the negative battery lead "2".



8. Check:
   • Battery terminals
   Dirt → Clean with a wire brush.
   Loose connection → Connect properly.
9. Lubricate:
   • Battery terminals

	Recommended lubricant **Dielectric grease**

10. Install:
    • Battery band
11. Install:
    • Rear right side cover
    • Seat
    Refer to "GENERAL CHASSIS" on page 4-1.

EAS28040

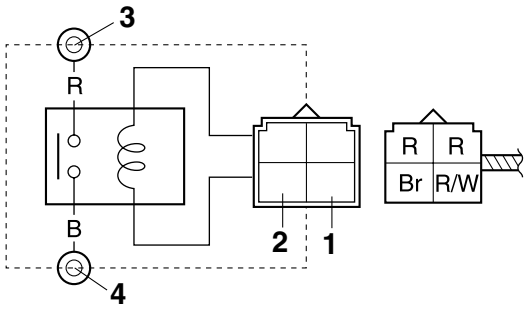
CHECKING THE RELAYS

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.

	Pocket tester **90890-03132**

1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown.
   Check the relay operation.
   Out of specification → Replace.

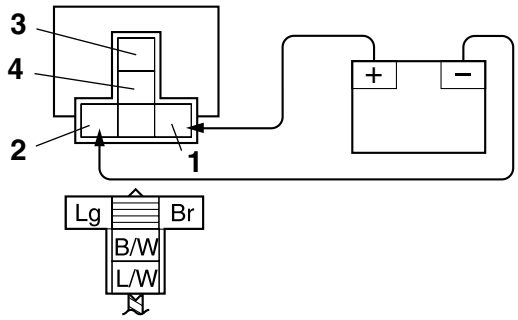
Starter relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

	Result **Continuity** **(between "3" and "4")**

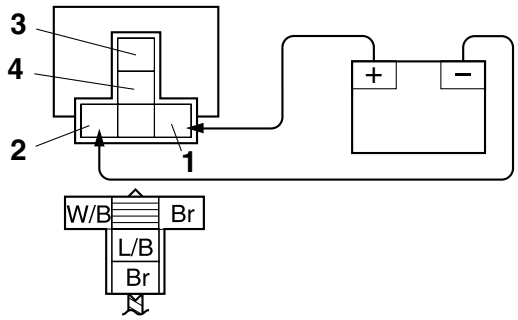
Starting circuit cut-off relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

	Result **Continuity** **(between "3" and "4")**

Headlight relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

EAS3C51015

CHECKING THE TURN SIGNAL RELAY

1. Check:
   - Turn signal light relay input voltages
     Out of specification → Poor circuit connection from main switch to turn signal light relay coupler. Repair.

Turn signal light relay input voltage
DC 12 V

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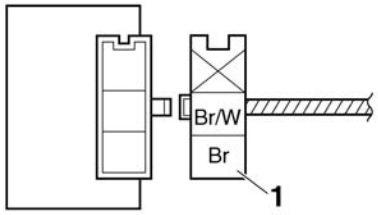
a. Connect the pocket tester (DC 20 V) to the turn signal light and hazard relay coupler as shown.

Pocket tester
90890-03132

Positive probe of the tester
Brown "1"
Negative probe of the tester
Ground to chassis frame



b. Turn the main switch "ON".
c. Measure the input voltage of the turn signal light and hazard relay.

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2. Check:
   - Turn signal light and hazard relay output voltage
     Out of specification → Replace the turn signal light and hazard relay.

Turn signal light and hazard relay output voltage
DC 12 V

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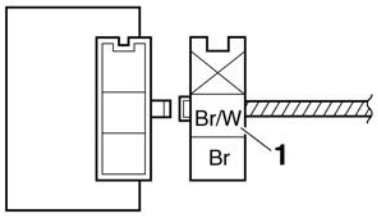
a. Touch probes of the pocket tester (DC 20 V) to the turn signal light and hazard relay coupler as shown.

Pocket tester
90890-03132

Positive probe of the tester
Brown/white "1"
Negative probe of the tester
Ground to chassis frame



b. Turn the main switch "ON".
c. Measure the output voltage of the turn signal light and hazard relay.

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EAS28050
CHECKING THE DIODE

1. Check:
   - Diode2
   - Diode3

   Out of specification → Replace.

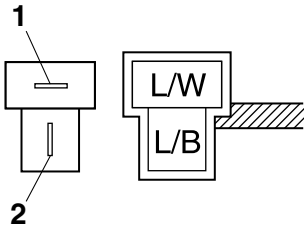
	Pocket tester 90890-03132

NOTE:

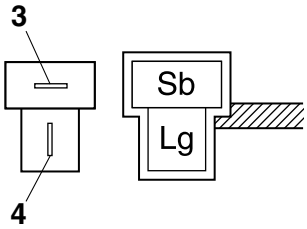
The following lists the specifications if you use the pocket tester (90890-03132).

	Diode2 **Continuity** **Positive tester probe → Blue/white "1"** **Negative tester probe → Blue/black "2"** **No continuity** **Positive tester probe → Blue/black "2"** **Negative tester probe → Blue/white "1"** **Diode3** **Continuity** **Positive tester probe → Sky blue "3"** **Negative tester probe → Light green "4"** **No continuity** **Positive tester probe → Light green "4"** **Negative tester probe → Sky blue "3"**

A



B



A. Diode2
B. Diode3

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a. Disconnect the diode from the wire harness.
b. Connect the pocket tester (Ω × 1) to the diode coupler as shown.
c. Check the diode for continuity.
d. Check the diode for no continuity.

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EAS28060
CHECKING THE SPARK PLUG CAP

1. Check:
   - Spark plug cap resistance

   Out of specification → Replace.

	Resistance 10.0 kΩ

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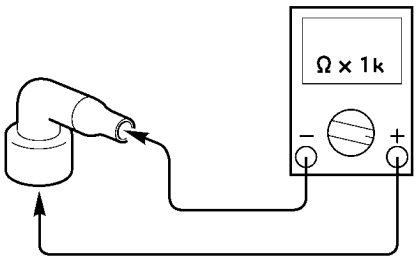
a. Remove the spark plug cap from the spark plug lead.
b. Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.

	Pocket tester 90890-03132



c. Measure the spark plug cap resistance.

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EAS28090
CHECKING THE IGNITION COIL
1. Check:
   • Primary coil resistance
   Out of specification → Replace.

Primary coil resistance
0.18–0.27 Ω

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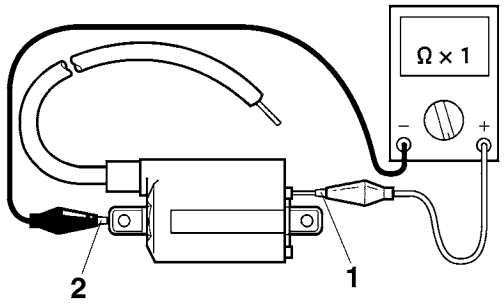
a. Disconnect the ignition coil connectors from the wire harness.
b. Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Pocket tester
90890-03132

Positive tester probe
Orange "1"
Negative tester probe
Ignition coil base "2"



c. Measure the primary coil resistance.

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2. Check:
   • Secondary coil resistance
   Out of specification → Replace.

Secondary coil resistance
6.32–9.48 kΩ

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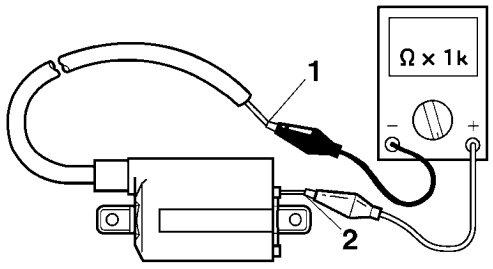
a. Disconnect the spark plug cap from the ignition coil.
b. Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

Pocket tester
90890-03132

Positive tester probe
High tension code "1"
Negative tester probe
Orange "2"



c. Measure the secondary coil resistance.

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3. Check:
   • Ignition spark gap
   Out of specification → Follow Step 5 and later of the ignition system troubleshooting procedure.
   Refer to "TROUBLESHOOTING" on page 7-3.

Minimum ignition spark gap
6.0 mm

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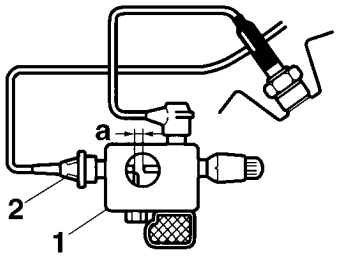
a. Disconnect the spark plug cap from the spark plug.
b. Connect ignition check "1" to the spark plug as shown.

Ignition checker
90890-06754
Opama pet-4000 spark checker
YM-34487



2. Spark plug cap

c. Turn the main switch "ON" and set the engine stop switch to the "∩".
d. Measure ignition spark gap "a".
e. Press start switch "⏻" to crank the engine, and gradually increase the spark plug gap until the engine misfires.

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EAS28110

CHECKING THE PICKUP COIL

1. Disconnect:
   - Pickup coil coupler (from the wire harness)
2. Check:
   - Pickup coil resistance
     Out of specification → Replace the pickup coil and stator assembly.

	Pickup coil resistance **279–341 Ω (Red–white)**

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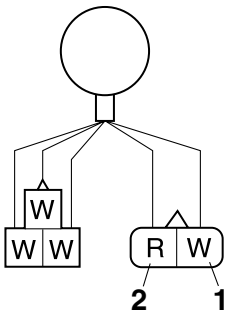
a. Connect the pocket tester (Ω × 100) to the pickup coil terminal as shown.

	Pocket tester **90890-03132**

Positive tester probe
White "1"
Negative tester probe
Red "2"



b. Measure the pickup coil resistance.

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EAS28150

CHECKING THE STATOR COIL

1. Disconnect:
   - Stator coil coupler (from the wire harness)
2. Check:
   - Stator coil resistance
     Out of specification → Replace the pickup coil and stator assembly.

	Stator coil resistance **0.560–0.840 Ω (White–white)**

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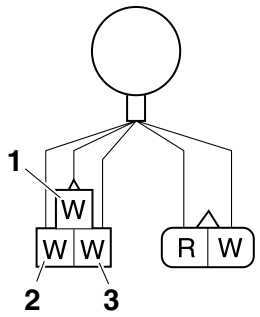
a. Connect the pocket tester (Ω × 1) to the stator coil coupler as shown.

	Pocket tester **90890-03132**

Positive tester probe
White "1"
Negative tester probe
White "2"

Positive tester probe
White "1"
Negative tester probe
White "3"

Positive tester probe
White "2"
Negative tester probe
White "3"



b. Measure the stator coil resistance.

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EAS28170

CHECKING THE RECTIFIER/REGULATOR

1. Check:
   - Rectifier/regulator input voltage
     Out of specification → Replace the rectifier/regulator.

	Rectifier/regulator input voltage above 14 V at 5000 r/min

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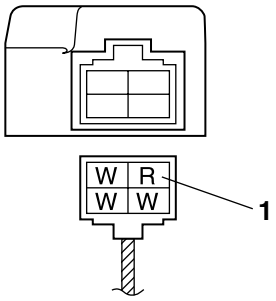
a. Connect a digital tachometer to the spark plug lead of the cylinder.
b. Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.

	Pocket tester 90890-03132

Positive tester probe
Red "1"
Negative tester probe
Ground to chassis frame



c. Start the engine and let it run at approximately 5000 r/min.
d. Measure the rectifier/regulator input voltage.

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EAS28180

CHECKING THE HORN

1. Check:
   - Horn resistance
     Out of specification → Replace.

	Horn resistance 1.01–1.11 Ω at 20°C (68°F)

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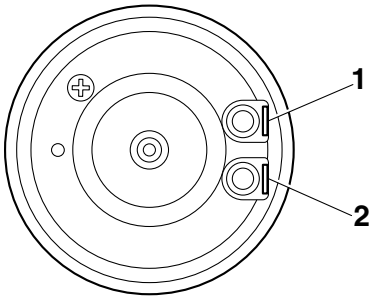
a. Disconnect the horn leads from the horn terminals.
b. Connect the pocket tester (Ω × 1) to the horn terminals.

	Pocket tester 90890-03132

Positive tester probe
Horn terminal "1"
Negative tester probe
Horn terminal "2"



c. Measure the horn resistance.

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2. Check:
   - Horn sound
     Faulty sound → Adjust or replace.

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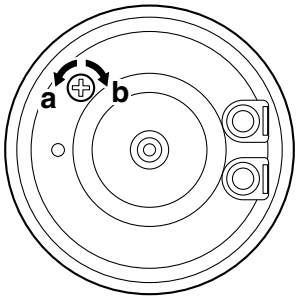
a. Connect a battery (12 V) to the horn.
b. Turn the adjusting screw in direction "a" or "b" until the specified horn sound is obtained.



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EAS28240

CHECKING THE SPEED SENSOR

1. Disconnect:
   - Speed sensor coupler
2. Check:
   - Speed sensor resistance
     Out of specification → Replace.

Speed sensor resistance
470–530 Ω 25 °C (77 °F)

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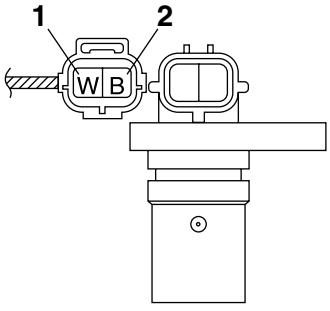
a. Connect the digital circuit tester to the speed sensor coupler (wire harness side).

Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927

Positive tester probe
White “1”
Negative tester probe
Black “2”



b. Measure the speed sensor resistance.

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EAS28270

CHECKING THE THERMO SWITCH

1. Remove:
   - Thermo switch
     (from the thermostat housing)

EWA13830

⚠ WARNING

- **Handle the thermo switch with special care.**
- **Never subject the thermo switch to strong shocks. If the thermo switch is dropped, replace it.**

2. Check:
   - Thermo switch continuity
     Out of specification → Replace the thermo switch.

Test step	Coolant temperature	Continuity
1	Less than 16°C (61°F)	YES
2	More than 16°C (61°F)	NO
3	More than 11°C (52°F)	NO
4	Less than 11°C (52°F)	YES

Step 1 and 2: Heating phase
Step 3 and 4: Cooling phase

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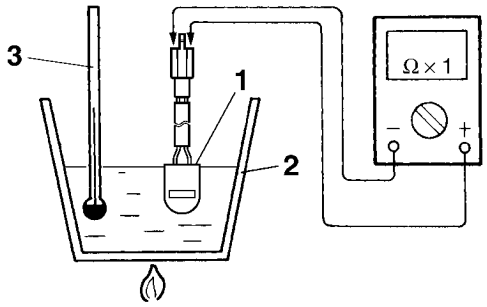
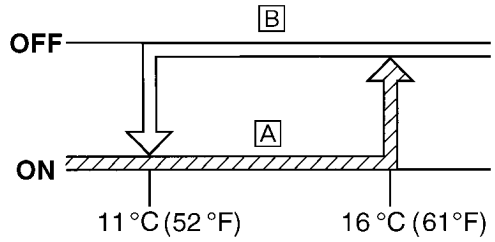
a. Connect the pocket tester (Ω × 1) to the thermo switch “1” as shown.
b. Immerse the thermo switch in a container filled with coolant “2”.
c. Place a thermometer “3” in the coolant.



d. Slowly heat the coolant, then let it cool down to the specified temperature.



A. When the water temperature increases
B. When the water temperature decreases

e. Check the thermo switch for continuity.

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EAS28310

CHECKING THE CARBURETOR WARMER

1. Check:
   - Carburetor warmer element resistance
     Out of specification → Replace.

	Carburetor warmer resistance **4.7–9.5 Ω 20°C (68°F)**

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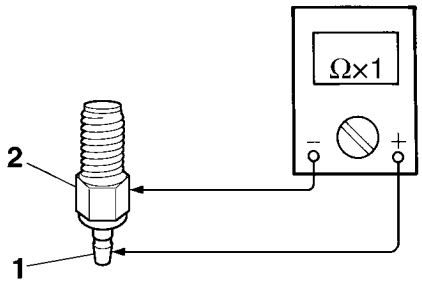
a. Remove the carburetor warmer leads from the carburetor.
b. Connect the pocket tester (Ω × 1) to the carburetor warmer as shown.

	Pocket tester **90890-03132**

Positive tester probe
Carburetor warmer terminal "1"
Negative tester probe
Carburetor warmer body "2"



c. Measure the carburetor warmer resistance.

TROUBLESHOOTING

EAS28450
TROUBLESHOOTING

EAS28460
GENERAL INFORMATION

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

EAS28470
STARTING FAILURES

Engine

1. Cylinder(s) and cylinder head(s)
   - Loose spark plug
   - Loose cylinder head or cylinder
   - Damaged cylinder head gasket
   - Damaged cylinder gasket
   - Worn or damaged cylinder
   - Incorrect valve clearance
   - Improperly sealed valve
   - Incorrect valve-to-valve-seat contact
   - Incorrect valve timing
   - Faulty valve spring
   - Seized valve
2. Piston(s) and piston ring(s)
   - Improperly installed piston ring
   - Damaged, worn or fatigued piston ring
   - Seized piston ring
   - Seized or damaged piston
3. Air filter
   - Improperly installed air filter
   - Clogged air filter element
4. Crankcase and crankshaft
   - Improperly assembled crankcase
   - Seized crankshaft

Fuel system

1. Fuel tank
   - Empty fuel tank
   - Clogged fuel filter
   - Clogged fuel strainer
   - Clogged fuel tank drain hose
   - Clogged rollover valve
   - Clogged rollover valve hose
   - Deteriorated or contaminated fuel
2. Fuel pump
   - Faulty fuel pump
   - Faulty fuel pump relay
3. Fuel cock
   - Clogged or damaged fuel hose
4. Carburetor(s)
   - Deteriorated or contaminated fuel
   - Clogged pilot jet
   - Clogged pilot air passage
   - Sucked-in air
   - Damaged float
   - Worn needle valve
   - Improperly installed needle valve seat
   - Incorrect fuel level
   - Improperly installed pilot jet
   - Clogged starter jet
   - Faulty starter plunger
   - Improperly adjusted starter cable

Electrical system

1. Battery
   - Discharged battery
   - Faulty battery
2. Fuse(s)
   - Blown, damaged or incorrect fuse
   - Improperly installed fuse
3. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
   - Fouled spark plug
   - Worn or damaged electrode
   - Worn or damaged insulator
   - Faulty spark plug cap
4. Ignition coil(s)
   - Cracked or broken ignition coil body
   - Broken or shorted primary or secondary coils
   - Faulty spark plug lead
5. Ignition system
   - Faulty ignitor unit
   - Faulty pickup coil
   - Broken generator rotor woodruff key
6. Switches and wiring
   - Faulty main switch
   - Faulty engine stop switch
   - Broken or shorted wiring
   - Faulty neutral switch
   - Faulty start switch
   - Faulty sidestand switch
   - Faulty clutch switch
   - Improperly grounded circuit
   - Loose connections
7. Starting system
   - Faulty starter motor
   - Faulty starter relay
   - Faulty starting circuit cut-off relay
   - Faulty starter clutch

EAS28490
INCORRECT ENGINE IDLING SPEED

Engine

1. Cylinder(s) and cylinder head(s)

- Incorrect valve clearance
- Damaged valve train components

2. Air filter
   - Clogged air filter element

Fuel system

1. Carburetor(s)
   - Faulty starter plunger
   - Loose or clogged pilot jet
   - Loose or clogged pilot air jet
   - Damaged or loose carburetor joint
   - Improperly synchronized carburetors
   - Improperly adjusted engine idling speed (throttle stop screw)
   - Improper throttle cable free play
   - Flooded carburetor
   - Faulty air induction system

Electrical system

1. Battery
   - Discharged battery
   - Faulty battery
2. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
   - Fouled spark plug
   - Worn or damaged electrode
   - Worn or damaged insulator
   - Faulty spark plug cap
3. Ignition coil(s)
   - Broken or shorted primary or secondary coils
   - Faulty spark plug lead
   - Cracked or broken ignition coil
4. Ignition system
   - Faulty ignitor unit
   - Faulty pickup coil
   - Broken generator rotor woodruff key

EAS28520

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES” on page 8-1.

Engine

1. Air filter
   - Clogged air filter element
2. Air intake system
   - Bent, clogged or disconnected carburetor air vent hose
   - Clogged or leaking air duct

Fuel system

1. Carburetor(s)
   - Faulty diaphragm
   - Incorrect fuel level
   - Loose or clogged main jet
2. Fuel pump
   - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to “Clutch drags”.

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560

FAULTY CLUTCH

Clutch slips

1. Clutch
   - Improperly assembled clutch
   - Improperly adjusted clutch cable
   - Loose or fatigued clutch spring
   - Worn friction plate
   - Worn clutch plate
2. Engine oil
   - Incorrect oil level
   - Incorrect oil viscosity (low)
   - Deteriorated oil

Clutch drags

1. Clutch
   - Unevenly tensioned clutch springs
   - Warped pressure plate
   - Bent clutch plate
   - Swollen friction plate
   - Bent clutch push rod
   - Broken clutch boss
   - Burnt primary driven gear bushing
   - Match marks not aligned
2. Engine oil

- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

EAS28590
OVERHEATING
Engine
1. Cylinder head(s) and piston(s)
   - Heavy carbon buildup
2. Engine oil
   - Incorrect oil level
   - Incorrect oil viscosity
   - Inferior oil quality

Fuel system
1. Carburetor(s)
   - Incorrect main jet setting
   - Incorrect fuel level
   - Damaged or loose carburetor joint
2. Air filter
   - Clogged air filter element

Chassis
1. Brake(s)
   - Dragging brake

Electrical system
1. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
2. Ignition system
   - Faulty ignitor unit

EAS28620
POOR BRAKING PERFORMANCE
- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose the union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS28660
FAULTY FRONT FORK LEGS
Leaking oil
- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

Malfunction
- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS28690
UNSTABLE HANDLING
1. Handlebar
   - Bent or improperly installed handlebar
2. Steering head components
   - Improperly installed upper bracket
   - Improperly installed lower bracket (improperly tightened ring nut)
   - Bent steering stem
   - Damaged ball bearing or bearing race
3. Front fork leg(s)
   - Uneven oil levels (both front fork legs)
   - Unevenly tensioned fork spring (both front fork legs)
   - Broken fork spring
   - Bent or damaged inner tube
   - Bent or damaged outer tube
4. Swingarm
   - Worn bearing or bushing
   - Bent or damaged swingarm
5. Rear shock absorber assembly(-ies)
   - Faulty rear shock absorber spring
   - Leaking oil or gas
6. Tire(s)
   - Uneven tire pressures (front and rear)
   - Incorrect tire pressure
   - Uneven tire wear
7. Wheel(s)
   - Incorrect wheel balance
   - Broken or loose spoke
   - Damaged wheel bearing
   - Bent or loose wheel axle
   - Excessive wheel runout
8. Frame
   - Bent frame
   - Damaged steering head pipe
   - Improperly installed bearing race

EAS28710
FAULTY LIGHTING OR SIGNALING SYSTEM
Headlight does not come on
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging

- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

Headlight bulb burnt out

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

Tail/brake light does not come on

- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

Tail/brake light bulb burnt out

- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

Turn signal does not come on

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal blinks slowly

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal remains lit

- Faulty turn signal relay
- Burnt-out turn signal bulb

Turn signal blinks quickly

- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

Horn does not sound

- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

EAS28740

WIRING DIAGRAM

XT250X/XT250XC 2008

1.Pickup coil
2.A.C. magneto
3.Rectifier/regulator
4.Fuse
5.Starter relay
6.Battery
7.Starter motor
8.Diode 1
9.Main switch
10.Right handlebar switch
11.Engine stop switch
12.Start switch
13.Diode 2
14.Clutch switch
15.Sidestand switch
16.Starting circuit cut-off relay
17.Diode 3
18.Neutral switch
19.C. D. I. unit
20.Ignition coil
21.Spark plug
22.Meter assembly
23.Neutral indicator light
24.Multi-function display
25.Speedometer
26.High beam indicator light
27.Turn signal indicator light
28.Speed sensor
29.Tail/brake light
30.Rear turn signal light (right)
31.Front turn signal light (right)
32.Front turn signal light (left)
33.Rear turn signal light (left)
34.Headlight
35.Rear brake light switch
36.Front brake light switch
37.Turn signal relay
38.Headlight relay
39.Horn
40.Left handlebar switch
41.Horn switch
42.Dimmer switch
43.Turn signal switch
44.Thermo switch
45.Carburetor warmer

EAS28750

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

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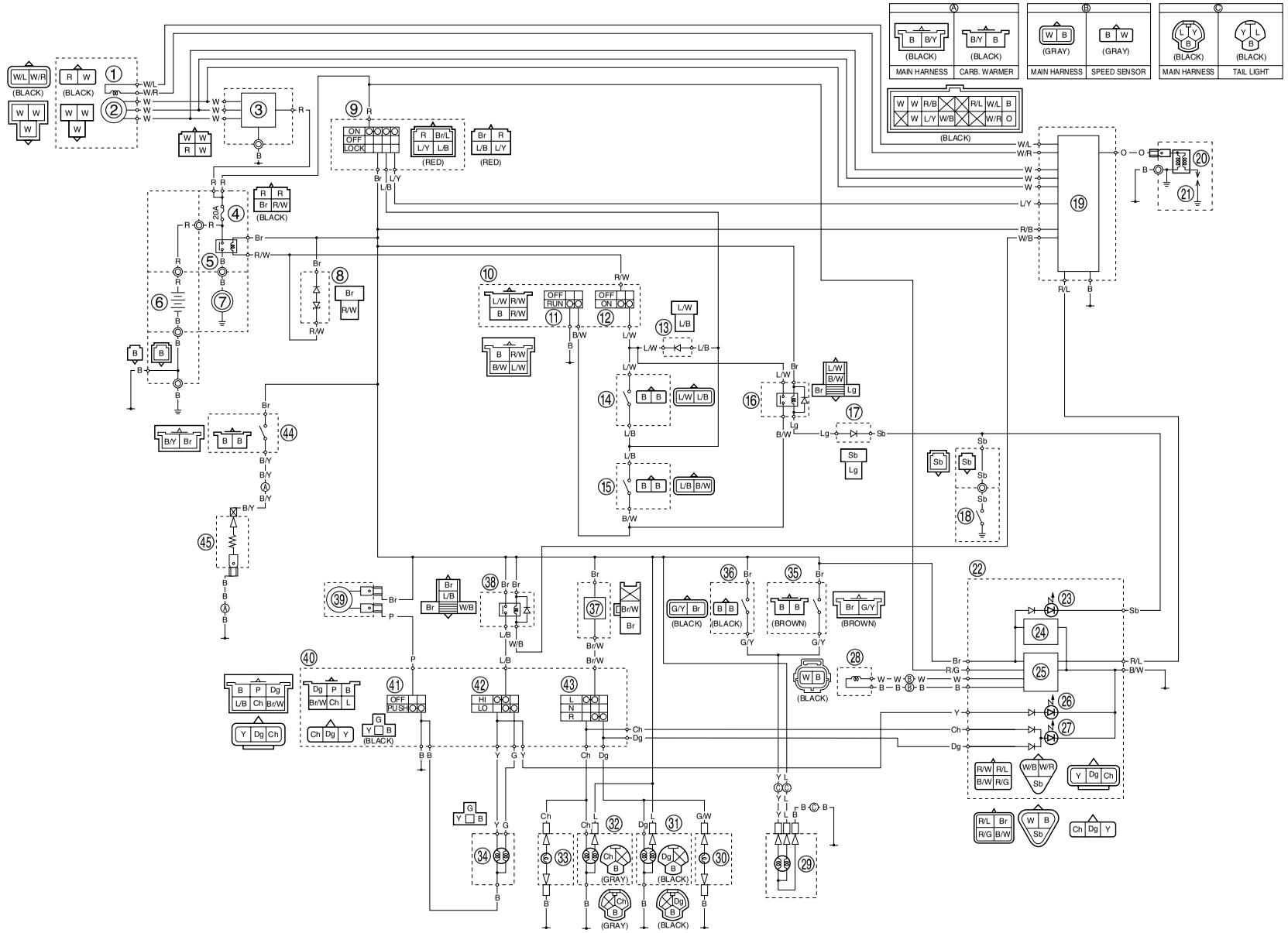
2008 XT250X/XT250XC WIRING DIAGRAM



2008 XT250X/XT250XC WIRING DIAGRAM